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THE

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THE CONTROL OF PULMONARY TUBERCULOSIS: SANATORIUM TREATMENT.

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NOTWITHSTANDING the numerous attempts which have been made to discover a specific remedy for pulmonary tuberculosis, hygienic measures still hold pride of place in the prevention and treatment of the disease. Though it is too early yet to expect any definite statement with regard to the efficacy of Professor Dreyer's de-lipoidated vaccine, reports from those investigating this treatment would lead us to believe that whilst the results in cases of glandular and skin tuberculosis appear satisfactory, pulmonary tuberculosis does not seem to respond in the same manner. Spahlinger's claims have not, apparently, impressed our representatives and the purchase was not recommended. An inquiry into the results of tuberculin treatment at Midhurst Sanatorium resulted as follows: "Collectively the results point to the conclusion that tuberculin treatment, when given in addition to the usual measures practised in a sanatorium, had no appreciable effect either for good or ill."[1] With regard to Camac Wilkinson's methods of tuberculin treatment it was stated in a confidential report to the Medical Research Council that Dr. Camac Wilkinson's system of treatment "did not appear to have claims over other methods of treating tuberculosis either with or without tuberculin which would justify its general adoption." On this question *The British Medical Journal* reserved its judgement laying down rules for investigation.[2][3]

And so in the campaign against pulmonary tuberculosis we must fight on yet awhile without a specific remedy.

This makes us turn once more to the methods in vogue in the attempt to set our house in order.

Historical.

Although the credit of establishing the first sanatorium and of advocating and practising the "open air" treatment of pulmonary tuberculosis must be given to an Englishman, Dr. George Bodington, of Sutton Coldfield, in Warwickshire, it was not until forty seven years afterwards that the treatment became definitely established in England, when Sir R. Philip founded the Royal Victoria Dispensary in Edinburgh, which ultimately included a sanatorium, hospital and farm colony. Medical men who had been patients under Otto Walther at Nordrach (1888) returned to England and followed his methods. It was not until 1899 that the Brompton Hospital for Consumption and

Diseases of the Chest established open air wards and in 1904 the Frimley Sanatorium of the Brompton Hospital was opened. About the same time Midhurst Sanatorium which bears the name of King Edward VII. also began to receive patients. These two institutions are the principal ones in the London County Council organization.

In 1911 the *National Insurance Act* became law and provided for the treatment of patients, erection of sanatoria and branchings, research and education. In May 1912, the Local Government Board urged all county councils to submit schemes to provide for the treatment of all cases within their area, such schemes not to be limited to insured persons but available for the entire population and in December the "Hobhouse Grant" was announced and the financial position set out.

The natural result of this was that treatment of and sanatorium benefit to patients with pulmonary tuberculosis was withdrawn by the National Insurance Commission; all insured persons were then to be treated under the tuberculosis scheme of a county council or a county borough council on the same basis as the ordinary civil population. This took effect from May 1, 1921.

Sanatorium Treatment and National Insurance.

There is no doubt that the grappling with the problem of tuberculosis by the National Insurance Commission was of considerable benefit, for with the funds at its disposal it established many institutions which would not have been otherwise brought into existence and so made many of the county council schemes possible. It was seen that if these institutions only provided for insured persons, the remainder of the civil population would receive no benefit and continue to be sources of infection. The council schemes were then evolved with the object of widening the scope of the campaign in order to bring all patients, insured and uninsured alike, into contact with the attacking forces.

It is to be hoped sincerely that something of the same nature will happen in Australia under the proposed National Insurance Act. Having regard to the experience in England, it is expected that the Commission will not restrict treatment *et cetera* to those insured under the act, but as they probably will provide for pulmonary tuberculosis, some scheme will have to be evolved. Let us hope that they will decide to recommend something after the nature of the "Hobhouse Grant" so that a separate organization for the control of tuberculosis may come into being, an organization which will undertake the prevention amongst and treatment and education of the whole civil population and one which will not have to restrict its activities to one section of the community. It seems as if our only hope of improving the tuberculosis organizations in Anstralia, lies in the National Insurance Commission recommending new links in the chain. Government sanatorium treatment in this country may be said to be almost non-existent, for owing to the lack of funds and lack of the pre-sanatorium links in the chain of prevention, our sanatoria are fast becoming homes for advanced cases. If this state of things continues, our whole line of treatment will become that of segregation of advanced cases; of removing the patients in the last stages from their own homes so that they may no longer be sources of infection. This can neither be called treatment nor prevention, for patients in this stage can expect no amelioration of their condition by any of our present known methods and it does not take into account the fact that from the time of onset of disease until admission in an advanced stage into a sanatorium, these patients are acting as infecting agents. The filling of our sanatoria with patients in advanced stages means taking away such benefits from those patients who would respond to the treatment. Once we allow our sanatoria to become "advanced homes" we virtually say to our "early" patients: "We can do nothing for you, or for your contacts, until such time as you have become an advanced case, when we will remove you to a sanatorium and see that you are no longer a menace to those around you."

The Objects of Sanatorium Treatment.

In discussing sanatorium treatment it may be as well to define the objects of that treatment and for this definition I quote Sir James Kingston Fowler:

> The primary object of sanatorium treatment is to fit the patient for the occupation in which he was engaged prior to the onset of his illness. To this general statement there are certain important reservations to be made:
>
> (1) The occupation may have been the direct or indirect cause of his becoming infected.
>
> (2) The occupation, although in itself harmless, may have been carried on under conditions which lowered his resisting power.
>
> (3) The occupation may have been one which required a degree of physical vigour such as few patients with arrested tuberculosis of the lungs can ever be expected to possess.
>
> (4) The occupation may have involved a degree of exposure to climatic conditions harmful in themselves and likely to accelerate the changes, such as localized emphysema and bronchitis which are incidental to the arrest of the disease by the process of fibrosis.
>
> (5) The "clinical" object is to produce not merely "quiescence" of the disease and not merely "arrest," but an "obsolete lesion."(4)

It will be thus seen that sanatorium treatment does not mean merely a period of residence in an institution where open air treatment is provided, but to some it means rehabilitation into their old environment and to others re-education into a new sphere. Thus a sanatorium is no longer an institution for the treatment of tuberculosis, but is a link in the chain along which all patients must travel. A sanatorium is useless without dispensaries in front of it or farm colonies behind it, no one link is independent of the other, the whole chain of organization being just as strong or as weak as the weakest link. It is the appreciation of these important reservations to this general statement that has resulted in the sanatorium being regarded as but one of the necessary links instead of, as formerly, the centre for the cure of pulmonary tuberculosis. The most important step in progress towards the provision of a new environment for

those whose previous occupation can no longer be undertaken was the introduction of the system of graduated labour. Curiously enough Bodington suggested a system of graduated exercise, but the credit for its introduction must be given to Marcus Paterson, the first Superintendent of Frimley Sanatorium and now of Colindale. I understand that graduated labour was first introduced with a view to providing the patient with auto-inoculation and there is no doubt that it does do so, but it goes a long way beyond that, for not only does it tend through the auto-inoculation to arrest the disease and so let us return the average patient to his previous occupation, but it allows him who has to seek a new environment, to seek out that which will be best suited to his physical fitness and yet prove a satisfactory and congenial mode of living. Still further claims can be made for this system. It provides variation in the daily task and so breaks the monotony which so easily creeps in, when rest away from friends and home surroundings has to be continued over a period of months. Anyone who has had the privilege of working in a sanatorium under graduated labour treatment, soon notices the different "atmosphere" on transferring to one where the old system of monotonous rest is in vogue. Again there is a psychological advantage in that the improvement is made visible by tangible steps, the promotion from grade to grade. Too little importance has hitherto been placed upon the psychological side of the tuberculous patient's character and too much reliance placed upon his *spes phthisica*. I venture to state that if the tuberculous subject was not so sure of his ultimate recovery, the domiciliary treatment of this disease would be on a sounder footing today. Under the graduated labour system it is possible to carry out treatment from the moment of diagnosis to the time when return to work is possible or till habilitation in a new environment is established by tangible steps the first of which dates from the fall of the temperature to within normal limits, as it will do in the vast majority of cases after a period of absolute rest.

Sanatorium Treatment at Frimley Sanatorium.

Let us examine briefly the system as it is carried out at Frimley Sanatorium today, under the direction of Dr. Wingfield. Naturally time and experience and circumstances have altered some of the details of the scheme laid down by Dr. Paterson, but the principle remains unassailed. Prior to the London County Council taking over the majority of the beds, it was quite usual for patients to remain twelve months or more; high grade labour was then always available and much of the beauty of the surroundings dates from that time. Now, however, under the Council scheme the period of stay has been regulated so that benefit may be given to the largest number. It may be argued that this limitation does not allow of the arrested lesions becoming obsolete, but the reply is that where in the opinion of the Medical Superintendent and the Official Visitor an extension beyond the three months is necessary or desirable owing to the progress made by the patient, such extension is granted. Thus, though the majority of the inmates reach the highest grade of the system, they do not remain long enough after attaining to that stage to allow of any additions being made to the gardens, the labour now being directed to the retention of the grounds in their present condition.

The following is a brief, bare outline of the "routine."

On transfer from Brompton Hospital each patient is thoroughly examined, the notes relating to the progress in hospital carefully considered, the type of work the patient had been doing inquired into and the whole constitution and environment of the patient made the subject of study after which a provisional decision is made. As a general rule each patient is up six hours daily and has normal temperature variations when transferred, that number of hours having been arrived at step by step.

At first the patients are "put on" to do so many "rounds"—a "round" being a little under one half-mile. Gradually the number of "rounds" is increased until eight are being "done" each morning and afternoon. After these have been done for one week, each individual is tested. His temperature, pulse and respiration are taken immediately after completion of the rounds and the pulse again counted five minutes later. The eight rounds should take the patient somewhere in the neighbourhood of two hours. Before the result of a test is regarded as satisfactory, the temperature must be normal and the pulse a little above or below one hundred per minute, falling below the hundred after five minutes. The respirations themselves do not indicate much, but signs of dyspnœa should be looked for. The women patients do six rounds of their own separate walk which is about the same length as that provided for the men. If the result of the test is satisfactory, the patient is promoted to the first grade and those failing to pass the test have their condition reviewed and progress is made more slowly.

The grades are divided into five, those for the women being less arduous than those for the men. Work at the grades goes on for two hours in the morning and two hours in the afternoon. If a patient be regarded as not quite fit for one grade though it is deemed desirable to take him off the lower grade, he may be put on to the higher one for shorter daily periods, the difference in time to be spent in rest—"promotion to grade . . . with rest." Promotion by half-grade is ordered at times, the morning working hours being spent in the lower grade and the afternoon hours in the higher grade. The men of Grade I. carry in light wicker baskets the chips cut by those of Grade II. from the small blocks into which those of Grade IV. saw the larger logs. Those in Grades I. and II. may also be put on to cleaning up the pine needles or such *débris* with light brooms and similar articles and carrying them over to the fire which is attended to by those in Grade III. Grade III. workers also use a saw, though a smaller one than that used by those in Grade IV., the logs too being smaller. Men of

Grade V. are employed in the piggeries, the vegetable gardens and other hard manual labours. Those in Grades IV. and V. may at times be called upon to carry out repairs to paths and roads *et cetera* through the grounds.

Each patient wears a button with the number of the grade on it and is spoken of as "Grade II." or "Grade IV." as the case may be. The men especially are usually very keen to progress as far as possible during their stay and it is impressed upon them that they must not look upon it as work, but as a method of treatment to fit them for their future labours. A medical officer patrols the grounds to see that each patient is kept employed, but he does not allow any exertion beyond that ordered. Occasionally an individual, becoming interested in his task, endeavours to do too much. Such a patient is advised as to the amount required of him.

In the case of the women it is a little difficult to vary the labour. Those in Grade I. carry the pine needles in baskets, while those of Grade II. sweep them up and Grade III. patients look after the fire. Those in Grade IV. are given raking or digging with a fork, whilst those in Grade V. use a spade. The flower beds are reserved for the women and efforts made to make their task as interesting as possible by forming new flower beds, putting in new borders of small stones, white-washed *et cetera* and other such means. Grade IV. or V. patients are sometimes called upon to rake new gravel over the paths.

Hard and fast rules are to be avoided and each patient should be given individual attention and consideration and reviewed once a week. The patient should be questioned as to weariness, palpitation, dyspnœa, pain or cough during or after each day's work, the chest condition, temperature, weight and amount and character of sputum carefully investigated. With all these points under review a fairly accurate estimate is made as to the fitness of the patient for that particular degree of exercise or for an increased amount.

This graduated labour system will show how closely the farm colony is linked to the sanatorium and how the value of a colony would be lost were this system not carried out at the sanatorium; each institution is dependent on the other. Just in the same way it is realized that there must be some part of the organization one at least of the duties of which is to care for those whom sanatorium treatment has fitted for return to their previous environment.

The Choice of Patients for Sanatorium Treatment.

There remains still one more aspect of sanatorium treatment to be discussed. From the very inception of the treatment, or more accurately soon after, it was realized that only those patients who it was considered would benefit by the treatment, should be admitted to these institutions. By that it was meant that patients in advanced stages, bed-ridden and hopeless, even were the activity of the disease arrested, would be chronic invalids consequent upon the amount of damage to the lung tissue which could not be repaired. Thus homes for patients in advanced stages came into being and sanatoria could be said to be of two classes. Now a third class is necessary and in the system of grading may be called Grade I. sanatorium.

This institution should be reserved entirely for patients with suspected, but not proven, pulmonary tuberculosis: patients without sputum or with sputum in which on at least three examinations tubercle bacilli have not been found. Many there are who will object to classifying this type of patient as tuberculous and produce figures to prove their contention and holding these views will insist upon these patients being refused admission to the benefits of the tuberculosis organization. Alongside the figures which they produce, there should be placed those giving the number of persons diagnosed as tuberculous without pathological evidence and the number of these same patients who afterwards manifest pathological evidence of the disease. The two sets of figures are equally reliable or unreliable. After all these patients possess a chain of symptoms with some signs and possibly a history which suggests early pulmonary tuberculous infiltration, and if by admission into and treatment in an institution we can raise them again to a degree of physical fitness, our treatment has not been in vain and even if these individuals are not infected, they are certainly the prepared ground, the susceptible soil of which we have all so glibly spoken on many occasions. I do not want to infer that early pulmonary tuberculosis should be diagnosed on slender evidence, but to maintain that if early infection is suspected on examination by two or more competent authorities, possibly officials of the organization, treatment in this Grade I. sanatorium should be provided. There is evidence that the ratio of actual deaths to expected deaths in this class of patient is considerably greater than in the ordinary civil population. For this evidence reference is made to Table XLVII. of Special Report Series No. 33 to the Medical Research Committee of the Privy Council—Pulmonary Tuberculosis: Mortality after Sanatorium Treatment.

Every patient in this table complied with the following three conditions.

(1) Condition on admission—Group I.
(2) Condition on discharge—Arrested.
(3) Sputum—No tubercle bacilli found on admission; no tubercle bacilli found on discharge.

There are one hundred and twenty-three patients who can be classed in this particular category; the number of females predominating over the males (66—57). Since discharge they have been observed for 721 years. Of these patients only six males and six females or twelve in all, have died. Their mortality, however, is more than two and a half times that experienced by the general population. The ratio of "actual deaths" to those "expected" is seen to be practically the same for both sexes: having regard to the comparatively small number of cases under observation this is a remarkable confirmation in results.

The mortality among this group of — — cases, when due to pulmonary tuberculosis, may be regarded as strong evidence in favour of correctness of the original diagnosis. This confirms clinical experiences, that although the finding of the tubercle bacillus establishes a diagnosis be-

yond any question, the disease is to be recognized with some measure of certainty in the absence of the specific organism.[5]

This increased ratio of deaths is found after sanatorium treatment, the disease having been arrested once and a degree of fitness restored. One wonders what the ratio is in suspected cases when the patient has not been subjected to such treatment.

This institution is virtually nothing more or less than a rest home in which the discipline, training and graduated labour of a sanatorium as described is carried out. The required nursing staff would not be large, as each of the inmates would be expected to carry out part of the daily task of upkeep, as soon as considered fit to do so. This could be made known to each applicant prior to admission. When inmates afforded pathological proof of infection they would be transferred to the Grade II. sanatorium.

This Grade II. sanatorium is the main one of the three, into which are admitted only those patients who are suffering from pulmonary tuberculosis in its earliest stages, the diagnosis of which has been conclusively established and who to all appearances have a good prospect of recovery. Those clearly in an advanced stage are not eligible for admission, but should be accommodated in the Grade III. institution. In addition to what has been said already as to the necessity for discipline, education and graduated labour in this Grade II. sanatorium, it may be stated that no such institution is complete without the installation of an X-ray plant and arrangements for carrying out the artificial pneumothorax treatment. This naturally raises the question of the provision of beds attached to the dispensaries or clinic. Absolute rest in bed is necessary for at least the first three weeks of artificial pneumothorax treatment and febrile patients should have the benefit of rest in bed, so that on admission to the sanatorium they may be afebrile or only slightly febrile, thus being better able to benefit to the full by the open-air treatment and graduated methods. A separate block may be erected for bed patients, but that means extra nursing staff and it is probably better to have this block in conjunction with the central or main dispensary or clinic.

Grade III. sanatorium is our present day home for patients in advanced stages and should be conducted more upon the lines of a hospital than of a sanatorium, but at the same time provision should be made for some mental and, may be, physical occupation and thus irksome monotony will be obviated. Deaths should not be allowed to occur in the Grade II. institution, but this object must not be attained merely by transferring patients showing rapid decline into Grade III., but by exercising careful discrimination when admitting patients. Accidental deaths from hæmoptysis *et cetera* cannot be obviated and are not included in this general statement. Naturally the provisional estimate of progress will not be borne out in some instances, but with a complete system such as this, revision and transfer may always be made.

Nothing more need be said about the farm colony at present, stress having already been laid on the interdependence of sanatoria and farm colonies.

Site and Climatology for Sanatoria.

A further factor now under consideration, which may influence sanatorium treatment in the future, is the question of site and climatology. From this we may take one point: The necessity for protection from rain-bearing winds. In this regard the history of Otto Walther's Sanatorium, at Nordrach, and that of Dettweiler's, at Falkenstein, make interesting reading. The success of Nordrach, the failure of Falkenstein and the consequent removal of the sanatorium to a sheltered spot at Ruppertshain appear to have been largely a question of site.

The influence of altitude may also have considerable bearing, especially when Rollier's results are considered. One conclusion from his book is quoted:

> In heliotherapy success must not be attributed solely to the action of light, as the quality of the air breathed and of the nutrition absorbed with rest are also factors of great importance. On the other hand, it would be a mistake to look upon light merely as an adjuvant to those other facts determining cure. The frequent observation of a close parallelism between clinical progress and sunny weather determines the value of sun treatment.[6]

Along with this Dorno's conclusions may be read. Dorno finds that the brightness (simultaneous intensity of illumination of direct and diffuse light on a horizontal surface) of the sky in winter at Davos is six times as great as at Kiel; in summer at Davos is 1.8 times as great as at Kiel; on the average the brightness at Davos is 2.5 times as great as at Kiel. The total amount of light is greater than at low altitudes and the annual variations are less.[7]

Conclusion.

The final words in this communication on sanatorium treatment may be left to Sir James Kingston Fowler:

> A sanatorium is not an institution, it is an atmosphere. The right system no doubt stands for a great deal, but the man at the head of it stands for far more. He must feel that he is an apostle, an evangelist, that he has a message to deliver and be filled with a desire to deliver it. The less time he spends in administration and the more he spends in preaching the gospel and inspiring his patients with a new hope in life, the better.[8]

In conclusion the writer would say, as he has said before, that many of the weaknesses attributed to the sanatorium at the present day, are not the property of the sanatorium but of the incomplete organization.

References.

(1) Special Report Series, Number 33, Medical Research Council, "National Health Insurance," 1919, page 52.

(2) Editorial in *The British Medical Journal*, December 8, 1923, page 1107.

(3) Editorial in *The British Medical Journal*, December 22, 1923, page 1231.

(4) Sir James Kingston Fowler: "Problems in Tuberculosis," Oxford Medical Publications, 1923, page 41.

(5) Special Report Series, Number 33, Medical Research Council, "National Health Insurance," 1919, pages 62 and 63.

(6) A. Rollier: "Heliotherapy," Oxford Medical Publications, 1923, pages 213-4.

(7) Dorno: *"Studie über Licht und Luft des Hochgebirges,"* Vieweg und Sohn, Braunschweig, quoted by A. Rollier in "Heliotherapy," page 177.

(8) Sir James Kingston Fowler: "Problems in Tuberculosis," Oxford Medical Publications, 1923, page 32.

EARLY POST-MORTEM CHANGES IN THE PANCREAS.

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THE relationship of the pancreas to disease is perhaps one of the most difficult problems in human pathology. Functional tests, experimental work and the methods of morbid histology have all tended to increase the complexity of the subject without clarifying the field of vision.

It is with some of these methods of morbid histology that I wish to deal. The use of complex organic substances for the purpose of identifying structure and the various departures from the normal has apparently been a failure in the case of the pancreas. Gross conditions such as acute and chronic pancreatitis, are recognized with the greatest ease, even with the simpler staining reactions, but the more obscure and commoner conditions, especially *diabetes mellitus,* seldom show an histological equivalent that can be recognized with certainty. Modern research, culminating in the description of the methods of Lane and Bensley, has proved of little value when applied to the human subject. What is the reason for this position? The answer lies in a knowledge of the phenomena of autolysis and necrosis in the pancreas. Besides the ordinary autolytic enzymes present in every cell after death, we have in the pancreas other powerful ferments which in combination with rapid alterations in hydrogen ion concentration quickly attack the highly specialized constituents of the pancreatic cells and especially the islet cells. Hence in a few hours these cells have assumed an histological appearance of a relatively stable character, temporary it is true, but yielding only to a process which, as it were, strikes at the foundations of the cell and produces disintegration on a large scale. As Wells(1) puts it, these changes "occur in certain foci, as if the trypsinogen had been activated in some areas before in others and the resulting changes are quite different from those of simple autolysis in that all structures except the stroma are destroyed and severely disintegrated wherever the changes occur at all. After thirty-four hours practically all nuclei have disappeared."

It appears then that for purposes of research we may divide the changes occurring in the pancreas after death into three groups: (i.) Those occurring immediately after death, during the first twelve hours, *id est* in the period between death and the usual time of conducting an autopsy; (ii.) those occurring up to the commencement of disintegration of the cell nucleus and body; (iii.) putrefaction.

This communication is especially concerned with the first group. Seldom is it possible to examine pancreatic tissue before or soon after death; at least eight hours have elapsed in the case of the ordinary autopsy material. Hence it seemed to the author that some useful results might be determined by a study of the pancreas during this time interval.

A study of the literature reveals an amazing paucity of material on pancreatic *post mortem* changes. Except for a very brief reference by Wells,(1) the problem seems to have been neglected. Cruickshank(2) in a paper on "The Histological Appearances Occurring in Organs Undergoing Autolysis," states that the rate at which the appearances of degeneration occur, differs for different organs and tissues. Highly specialized cells are more rapidly destroyed than are non-parenchymatous cells and connective tissue. As a whole the suprarenals and pancreas become necrotic very rapidly.

METHOD OF INVESTIGATION.

The pancreas of the dog and guinea pig were the basis of the following studies. In the experiments the first aim was to obtain conditions resembling as closely as possible those present in the case of ordinary human autopsy material.

A dog was anæsthetized with ether, artificial respiration by means of a motor air pump being employed for maintenance of aeration. Death was then brought about by cutting off the air supply. The abdominal cavity was exposed and the pancreas quickly removed. It was kept in a sterile jar at room temperature throughout the time of experimentation.

In another series of experiments the pancreas was left within the cavity of the animal, thus approaching more closely to autopsy conditions. The results obtained in the latter case are presented here. Small pieces of pancreatic tissue were removed immediately after death, four hours and eight hours later. These were placed for twenty-four hours in various fixative solutions:

(i.) Saline solution of "Formalin," 1 in 10 dilution;
(ii.) "Formalin," 1 in 10 dilution;
(iii.) "Formalin," 1 in 20 dilution;
(iv.) Saturated aqueous perchloride of mercury solution;
(v.) Alcohol 70%.

Afterwards they were put through the ordinary alcohol series for paraffin sections and finally embedded in paraffin in the usual manner.

Frozen sections were also employed as a check against the more elaborate paraffin preparation.

When guinea pigs were used, the animals were killed by dividing their neck vessels. The body was kept at room temperature for twelve hours, pieces of the pancreas being removed at death and subsequently four, eight and twelve hours later. This method was employed particularly for the work on the *A* and *B* islet cells, the initial results reported by Lane having been obtained with the guinea pig's pancreas.

In this paper, the results obtained by using three separate staining methods are reported. These

methods were: (i.) Hæmatoxylin and eosin—for the purpose of determining the grosser changes in cell and nuclear outlines; (ii.) Van Gieson's method—for the study of certain types of granule cells, especially those found in the islets; (iii.) Lane and Bensley's methods—for the study of the islet cells.

PART I.

CHANGES IN THE CELL AND NUCLEAR OUTLINES.

In investigating changes in the cell and nuclear outlines the usual method of staining the sections with hæmatoxylin for fifteen minutes and eosin for fifteen seconds was adopted.

Immediately After Death.

Immediately after death the acinar cells show a definite affinity for eosin, staining a deep pink or purple with well-defined, blue nuclei and blue coloration at the periphery of the cells.

Islet cells stain a deep pink and show no granules. Nuclei are well marked.

Four Hours After Death.

Four hours after death the acinar cells stain a diffuse pink or red colour, with blue coloration at the periphery or near the lumen. A few cells appear as pale blue masses with fine pink granules. Nuclei are well defined.

Islet cells stain a deep pink.

Eight Hours After Death.

Eight hours after death the majority of the acinar cells show a faint pink cytoplasm with small globules of very light blue or purple staining. Patches of cells show faint blue staining only.

Islet cells for the most part show the same pink coloration, but with formalin fixation an element of blue is introduced amongst the pink and some of the cells take on a distinct purple appearance.

No definite alteration in the outline of the acinar cell could be detected during this period. It was noticed that fixation with saturated perchloride of mercury produced rather indefinite cell outlines in all sections.

Shrinkage of islet cells was very evident and this was confirmed by actual measurement with a micrometer scale.

Acinar nuclei were well defined and stained deeply during the whole of the period, except at the eighth hour when areas were seen in which the nuclei appeared fainter in their staining. Islet nuclei also began to be affected about the same time.

Résumé.

The chief alterations made evident by this method of procedure during the first eight hours after death thus appear to be: (i.) Extension of the nuclear stain to the cytoplasm, well marked in the case of the acinar cells, less evident with the islet cells; (ii.) no definite alteration in outlines of acinar cells, but a very definite shrinking of islet cells accompanied by indefiniteness of outline; (iii.) slight change in the staining of acinar and islet nuclei, evident about eight hours after death.

It seems then that shortly after death the islet cells begin to shrink, become less definite in outline and their nuclei show alterations in staining properties, at the same time becoming less definite as regards their boundaries. Acinar cells show similar changes to a lesser degree and there is some evidence that nuclear material is being discharged into the cytoplasm at an early date.

PART II.

THE CHANGE IN THE GRANULE CELLS—SAGUCHI'S TYPES.

In investigating the changes in the granule cells, Saguchi's types, the method of staining as described by Van Gieson[3] in 1889 was strictly adhered to.

Immediately After Death.

Immediately after death acinar cells stain either a deep red or maroon with yellow globules or else a yellow colour. The red colour is due to the presence of many tiny pink granules.

Islet cells are light pink in colour as a rule, many minute pink granules being distinguished. Some of the cells stain yellow.

Four Hours After Death.

Four hours after death acinar cells show all stages of colour between yellow and red. Granules are easily distinguished.

Islet cells stain a bright pink colour, due to the presence of granules. The cytoplasm of a few cells is distinctly yellow.

Eight Hours After Death.

Eight hours after death many of the acinar cells stain a bright yellow, pink granules being picked out with ease near the periphery and lumen. Other cells are a deep orange colour, with large yellow globules and a few tiny pink granules. In some blue staining around the nuclei can be distinguished.

Islet cells for the most part stain orange; a few are pink whilst a very few are bright yellow. Granules are few in number, being absent in most cells.

The same alterations in the cell outlines and nuclei are to be seen as described in the preceding section. This change in character from fuchsinophil to picric tendency, so very marked in the case of the islet cells, was rather a puzzling problem at first, but the application of Saguchi's[4] methods proved illuminating.

Saguchi's Classification.

Saguchi, working with the pancreas of *Rana temporaria*, stated that in preparations fixed in sublimate-osmic-chromic acid, "Formalin," Maximow's, Regaud's, Meve's or Zenker's fluid and stained with acid fuchsin, iron hæmatoxylin *et cetera* five groups of cells in the islets can be detected: "*a*," "*b*," "*c*," "*d*" and "*e*" cells.

"*a*" cells contain many granules which stain heavily. The cells are cylindrical, pyramidal, polygonal or irregular in shape. The nucleus is spherical or polygonal with a thick nuclear membrane which is thrown into folds; the nuclear network is well marked and its meshes closer than those of the nuclei of acinar cells.

"b" cells contain granules which are fainter than those of the *"a"* cells. The cells show a shape similar to that of the *"a"* cells, but narrow, elongated cells are not infrequent. The nucleus is large and oval with smooth and indistinct contour. The nuclear network is indistinct and there are several small nucleoli.

"c" cells contain still fainter granules, not evenly distributed. The cells are smaller than the preceding types, being long and narrow or short and cylindrical, pyramidal or polygonal. The nucleus is irregular with a less distinct membrane which may be thrown into folds. The nuclear network is indistinct and nucleoli are small.

"d" cells show a heavily stained cell body, but no granules. The nucleus is oval and near the middle of the cell. The nuclear membrane is less smooth, but the intra-nuclear network is very apparent and the meshes close together. The nucleoli are very small. Cells are scanty.

"e" cells are non-granular and show a transparent cytoplasm when stained with iron hæmatoxylin or acid fuchsin. The nucleus is similar to that of the *"b"* cells with one or two nucleoli.

Interpretation of Results According to Saguchi's Classification.

Now in my experiments the staining method used is included in Saguchi's list, so that the *post mortem* changes are to be interpreted in the light of his descriptions and accordingly I have attempted to do this.

Re-examination of sections has shown the following:

Immediately After Death.

Immediately after death *"a"* cells are prominent with deep fuchsinophil granules and cytoplasm staining with picric acid.

"b" cells are numerous with fainter fuschsinophil granules and cytoplasm staining with picric acid.

"c" cells caused me some difficulty. I found it hard to be sure of them and doubt very much whether in the dog's pancreas they are to be found.

"d" cells—a few can be picked out.

"e" cells are definite, yet not numerous. The cytoplasm stains deeply with picric acid.

Hence at this stage, the islets as a rule stain a pink (fuchsinophil) colour. Those islets showing a yellow coloration contain many *"d"* and *"e"* cells.

Four Hours After Death.

Four hours after death *"a"* cells are few in number. The outlines are indistinct though the nucleus is very characteristic.

"b" cells are more evident than in the preceding case, although relatively few in number.

"c" cells are not distinguishable.

"d" and *"e"* cells appear more evident with well defined features.

Hence at this stage the islets stain as a rule pink with yellow cells becoming more common.

Eight Hours After Death.

Eight hours after death *"a"* cells are very few in number. The majority show the typical closely felted network and well defined nuclear membrane, but contain no granules.

"b" cells are very few in number with no granules in most. Nuclei are indistinct and nuclear network is fading.

"c" cells are approached in their characteristics by certain of the islet cells, but these islet cells are probably degenerative forms of the other types.

"d" cells are difficult to pick out.

"e" cells are definitely less in number, though still easily picked out.

Hence at this stage the islets as a rule stain an orange or yellow colour and this is the usual appearance of the islets as seen in ordinary autopsy material.

Résumé.

We can thus define more or less accurately the progress of early *post mortem* change in the pancreas as follows: (i.) The earliest changes affect the granules, so that the *"a"* cells approach in type the *"b"* cells, whilst these in turn pass through a stage resembling *"c"* and *"e"* cells, when granules are no longer distinguished; (ii.) following on these granular changes, alterations in the characteristics of the nuclei occur, so that the granular cells still further resemble the non-granular cells; (iii.) at the same time there is a definite destruction of whole islet cells, so that many islets disappear leaving empty spaces; (iv.) acinar cells much more slowly lose their granules which apparently are more resistant to autolytic and other enzymes than the islet granules. It is natural to conclude that the acinar granules differ in composition from the islet granules.

PART III.

CHANGES IN THE GRANULE CELLS—BENSLEY AND LANE'S TYPES.

The presence of granules in the islet cells has been known for some time. The investigations of Laguesse[4,5] 1898-1901, on the islets of Langerhans showed that the cells of the islets contained granules which were present both in the living as well as the dead structure. These granules were extremely numerous and stained brilliantly with safranin and gentian violet, *id est* rosaniline dyes. Laguesse pointed out that they were analogous in their arrangement, in their refraction, in their brown coloration with osmic acid and in their red coloration with safranin to zymogen granules.

This work of Laguesse had been carried out on the islets of vipers and sheep both from the histological and histogenetic standpoint.

Diamare[6] in 1899 drew attention to large, granular, deeply staining cells in the islets of the rabbit's pancreas, whilst Schulze[7] in 1900 found similar cells in the islets of the guinea pig's pancreas.

Mankowski[8] in repeating Schulze's work, was able to confirm Laguesse's observations. Numerous other observers also noted granules in the islet cells. Then came the admirable work of Lane[9] in 1907, carried out under the supervision of Bensley. Lane, working with Bensley's neutral gentian stain and special methods of fixation, concluded that:

1. The islets of Langerhans in the pancreas of the guinea pig consist of two types of cells: (i.) A type containing a granular substance that is precipitated by alcohol of a strength of from 50% to 70%—the *A* cells; (ii.) a type, the granular content of which is precipitated by an aqueous-chrome-sublimate fluid—the *B* cells.
2. The granular substance that is precipitated by alcohol, is dissolved by the chrome-sublimate fluid and the substance that is precipitated by the chrome-sublimate fluid, is dissolved by alcohol.
3. Neither of these granular substances is of the same chemical character as the zymogen granules of the pancreas cell.
4. Neither is of the same chemical character as the pro-zymogen of the pancreas cell.

Lane pointed out further that the *A* cell is large and vivid, its chromatin content small and distributed in a few small spherical masses. In some the granules are packed together throughout the entire cytoplasm and seem to lie directly against the nuclear membrane. In others the granules are determined in a mass bordering closely on the capillaries, while the remainder of the cytoplasm is comparatively or completely free of them.

The *B* cells are considerably smaller and more numerous. Their nuclei are central, circular, less vesicular than in the *A* cells with much chromatin, frequently in the form of a network.

Cells intermediate between the two types can be seen, especially in preparations treated with Ehrlich's hæmatoxylin before neutral gentian violet.

Bensley[10] in his remarkable monograph "Studies on the Pancreas of the Guinea-pig" 1911-12, confirmed the work of Lane and discussed at length the histology of acinar and islet cells. He suggested that the *A* cells are derived from the ducts.

The results of Bensley and Lane were confirmed by Homans[11] during 1912, 1913 and 1914. Homans found that only the *B* cells suffer loss of granules and degenerate in experimental diabetes, whilst the *A* cells persist. He later demonstrated similar vacuolation and degeneration of *B* cells in a case of human *diabetes mellitus*.

Martin[12] at the suggestion of F. M. Allen reinvestigated the subject very fully in 1922, using a modified staining method. He stated that isolated cells containing *A* granules were to be found along the small ducts and that in certain places islet cells could be seen that appeared to contain both types of granules. According to Martin there are four stages of alteration in the islets of diabetic animals: (i.) The stage in which the *B* cells appear swollen, more sharply defined, with a thinning out of their granular contents; (ii.) the stage of vacuolation of the *B* cells which are completely emptied of their granules and show a clear protoplasm with well preserved nucleus and cell outline; (iii.) the stage of degeneration of *B* cells, marked by shrinkage of the nucleus and breaking down of the cell body; (iv.) disappearance of *B* cells, leaving islets made up of *A* cells alone.

The fourth stage has only occasionally been observed in experiments upon animals, never in a case of diabetes in man.

In this investigation, the effects of *post mortem* changes on the *A* and *B* cells of the islets have been studied. The method of the investigation has already been described. The technique of Lane[13] was closely adhered to, the aqueous-chrome-sublimate and alcohol-chrome-sublimate fixation methods being employed.

Results.

Immediately After Death.

The condition immediately after death is represented in Figure I. (see page 537).

Acinar cells show deep violet zymogen granules with an active, deeply staining, well-defined nucleus and a very definite cell outline.

A cells show the typical appearances described by Lane and Bensley and are relatively few in number.

B cells are smaller than the *A* cells but more numerous with the typical appearances easily picked out.

Four Hours After Death.

The condition four hours after death is represented in Figure II. (see page 537).

Acinar cells stain well with deeply staining, well-defined, active looking nuclei. Zymogen granules are well marked and of the same size. But the outlines of many of the acinar cells are indistinct and some of the cells show evidence of commencing destruction. This occurs in patchy fashion, rather than as a diffuse change.

A cells are well marked and more easily picked out. They show all of their special features.

B cells are greatly decreased in numbers, so that they are less numerous than the *A* cells. Some show swelling. Others show loss of granules, being stained lightly after fixation with aqueous-chrome-sublimate. No vacuolation is obvious. Nuclei appear faint with indefinite outlines.

Eight Hours After Death.

The condition eight hours after death is represented in Figure III. (see page 537).

Acinar cells show great shrinkage with indistinct and irregular cell outlines. Many of the cells have large and distinct zymogen granules, others show granules in all stages of degeneration. The nuclei of the acinar cells as a rule stain deeply, but some are beginning to lose their staining properties. Acinar changes are distinctly focal, not diffuse.

A cells can be picked out in very small numbers. They show faint staining of granules and indistinct, swollen outlines. Nuclei appear unchanged.

No *B* granules are to be found. Many of the islet cells are quite free from granules. Some of the islets have disappeared, clear spaces showing where the islets were situated.

Twelve Hours After Death.

The condition twelve hours after death is represented in Figure IV. (see page 537).

Acinar cells show great shrinkage, some actually breaking up into granular masses, many cells separating completely from their fellows. Zymogen granules are absent in some cells; in others they stain very faintly and are small, whilst in others they appear larger and fewer in number. The nuclei stain well, but show some shrinkage in size.

This was confirmed by measurements with a micrometer scale. The nuclear outline is indistinct in a few cases.

Changes in acini are focal rather than diffuse.

Both *A* and *B* granules have disappeared, the islet cells being free from granules and showing changes in their nuclei. Clear spaces, corresponding with the position of former islets, can be seen.

Résumé.

It appears from these results that the early *post mortem* changes in the pancreas include: (i.) Swelling, loss of granules and nuclear changes, eventually leading to disappearance of many of the *B* cells by the eighth hour after death; (ii.) a similar change in the *A* cells at a slightly later period, with disappearance of many of the *A* cells by the twelfth hour after death; (iii.) focal acinar changes, with shrinkage, destruction of zymogen granules and slight alterations in the staining power of the nucleus and cytoplasm by the twelfth hour after death.

The remarkable resemblance to the changes described as occurring in experimental diabetes by Homans and Martin is striking. Apparently the factors involved in both these cases are of a similar nature. With *post mortem* alterations the cutting off of the blood supply to the cells, with the change in hydrogen ion concentration and the subsequent activation of autolytic and bacterial enzymes, is the main factor concerned. With experimental *diabetes mellitus* there is overwork of the islet cells and apparently the waste products of metabolism are not adequately dealt with and therefore accumulate, the cells eventually dying. Autolytic ferments are then set free and the cells show changes similar to those found after death from other causes. The acinar changes after death occur in foci, as pointed out by Wells.[14] These can be detected at a very early period, much earlier than that stated by Wells and are associated with alterations in zymogen granules. Whether there is an intimate relationship here, the breaking down of the zymogen granules initiating the changes in the acinar cells, is not apparent, but is not unlikely. One thing is certain, that the zymogen granules are much more resistant to *post mortem* change than the islet granules. This fact may be added to the evidence collected by Lane that the granular substances differ in composition from the zymogen granules.

Another point of interest is that the islet granules disappear some considerable time before nuclear changes are seen. The granular substance must be of an extremely unstable character, a fact that the recent work on "Insulin" has made very evident.

It is obvious from these results why the pathology of *diabetes mellitus* and allied conditions affecting the pancreas remains so obscure. The early *post mortem* changes tend to obliterate all that might be of help in the deciphering of the puzzle and what is more, produce changes identical with those resulting from disease. Until facilities for the examination of the pancreas as soon after death as possible, within four hours at least, are placed in the way of the pathologist, the pathology of the pancreas must remain a closed book.

Conclusions.

1. *Post mortem* changes affect the cells of the pancreas in the following order: (*a*) *B* cells; (*b*) *A* cells; (*c*) acinar cells.
2. The most important changes occur within the first eight hours.
3. Zymogen granules are much more resistant to *post mortem* change than the *A* and *B* granules. This is further evidence that the former differ from the latter in composition.
4. The similarity of early *post mortem* changes in the islets to those occurring in experimental and human *diabetes mellitus* is apparent.

Acknowledgments.

All of this work was carried out in the Pathological Laboratory and I am deeply indebted to Professor Sir Harry Allen for his encouragement and help.

My thanks are due to the Bacteriology and Physiology Departments for the supply of animals for purposes of experiment.

Mr. W. Dickinson, of the Pathological Laboratory, was good enough to help me with the technical work and together with Mr. Hector Marriott prepared the micro-photographs.

References.

(1) H. G. Wells: "The Relation of Autolysis to the Histological Changes Occurring in Necrotic Areas," *The Journal of Medical Research*, July, 1906, page 149.

(2) J. Cruickshank: "The Histological Appearances Occurring in Organs Undergoing Autolysis," *The Journal of Pathology and Bacteriology*, Volume XVI., 1911-1912, page 167.

(3) I. Van Gieson: "Methods of Examination of the Nervous System," *New York Medical Journal*, July 20, 1889, page 57.

(4) S. Saguchi: "Cytological Studies of Langerhans's Islets," *American Journal of Anatomy*, 1920-1921, Volume XXVIII., page 1.

(5) E. Laguesse: "*Sur la Structure du Pancréas chez Quelques Ophidiens et Particulièrement sur les Ilôts Endocrines*"; *Archives d'Anatomie Microscopique*, Paris, 1901, *Tome IV., pages* 157-218; "*Recherches sur l'Histologie du Pancréas chez le Mouton*"; *Journal de l'Anatomie et Physiologie*, Paris, 185, *Tome* XXI., *pages* 475-500.

(6) V. Diamare: "*Studii Comparativi sulle Isoli di Langerhans*"; *International Monatsschrift für Anatomie und Physiologie*, Leipzig, 1889, *Band* XVI., *Seite* 155.

(7) W. Schulze: "*Die Bedeutung der Langerhanschen Inseln im Pankreas*"; *Archiv für mikrokopisches Anatomie und Entwickgsgesch*, Bonn, 1900, *Band* LVI., *Seite* 49.

(8) A. Mankowski: "*Uber die mikroscopischen Veränderungen des Pankreas nach Unterdinung einzelner Teile*"; *Archiv für mikroscopisches Anatomie und Entwickgsgesch*, Bonn, 1902, *Band* LIX., *Seite* 286.

(9) M. A. Lane: "The Cytological Characters of the Areas of Langerhans," *American Journal of Anatomy*, November, 1907, Volume VII., page 409.

(10) R. R. Bensley: "Studies on the Pancreas of the Guinea Pig," *American Journal of Anatomy*, November, 1911, Volume XII., page 297.

(11) J. Homans: *Proceedings of the Royal Society*, London, 1912, Series B., Volume LXXXVI., page 73; "Degeneration of the Islands of Langerhans Associated

ILLUSTRATIONS FOR DR. GORDON CAMERON'S ARTICLE.

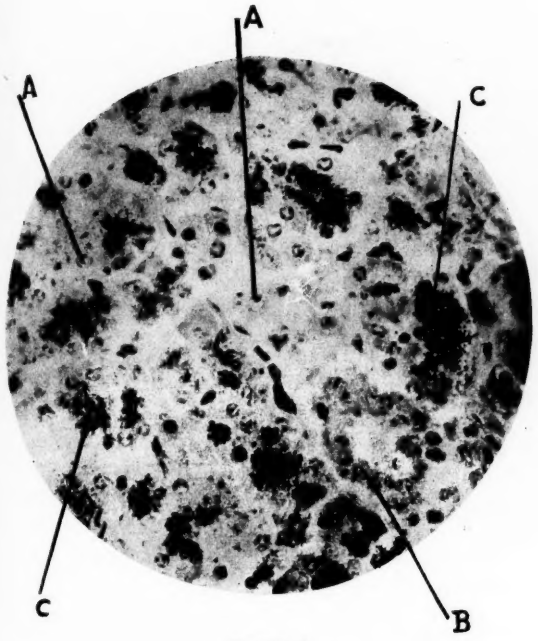

FIGURE I.

Pancreas Immediately After Death. Section from Guinea Pig. Fixation with Lane's Aqueous-Chrome-Sublimate Solution. The Acinar Cells, *A* and *B* Cells are Clearly Shown. A = *A* Cells; B = *B* Cells; C = Acinar Cells, Showing Large Zymogen Granules.

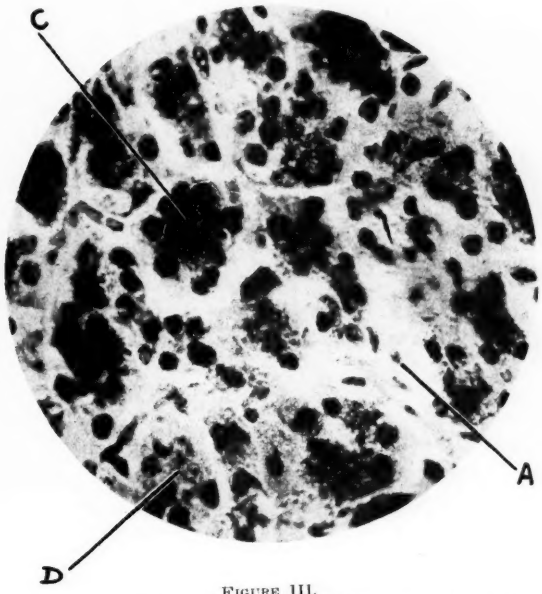

FIGURE III.

Pancreas Eight Hours After Death. A = *A* Cell; C = Acinar Cell Showing Deep Staining of Zymogen Granules; D = Acinar Cells, Showing Loss of Zymogen Granules and Early Nuclear Changes. Magnification × 900.

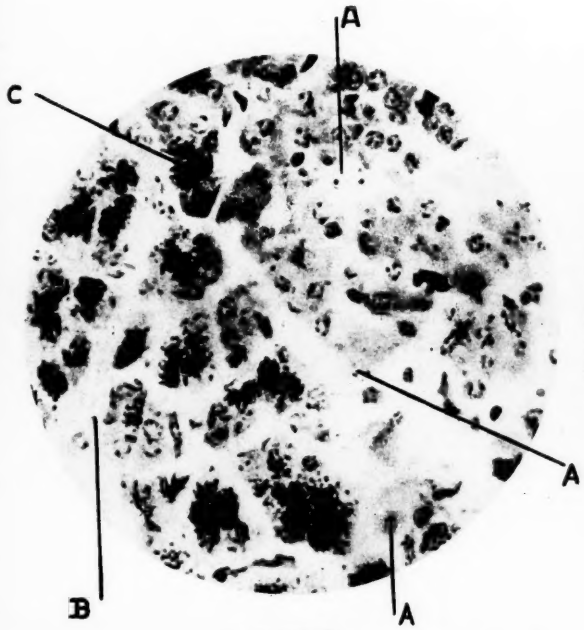

FIGURE II.

Pancreas Four Hours After Death. Section from Guinea Pig. Fixation with Lane's Aqueous-Chrome-Sublimate Solution. *A* Cells are Prominent; *B* Cells much less Evident and Staining Poorly; Acinar Cells Well Marked.

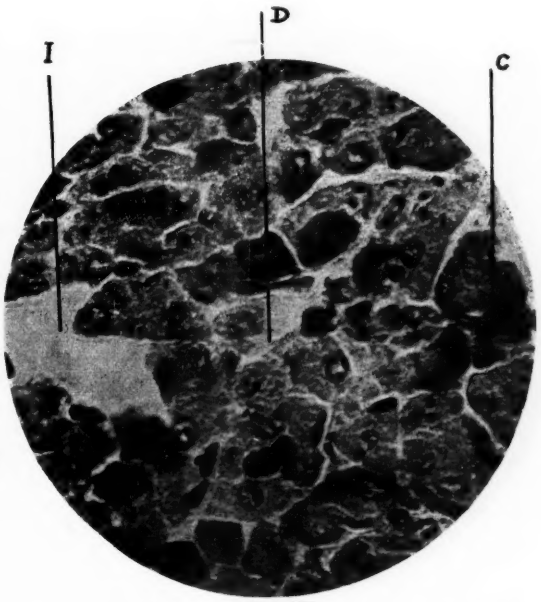

FIGURE IV.

Pancreas Twelve Hours After Death. I = Space where an Islet was Situated; C = Acinar Cells Showing Deep Staining of Zymogen Granules; D = Acinar Cells Showing Loss of Zymogen Granules.

with Experimental Diabetes in the Cat," *The Journal of Medical Research*, March, 1914, page 49; "A Study of Experimental Diabetes in the Canine and its Relation to Human Diabetes," *The Journal of Medical Research*, September, 1915, page 1.

(10) W. B. Martin: "Experimental Studies in Diabetes: Series III., The Pathology of Diabetes"; (2) "Granule Stains of the Islands of Langerhans of the Diabetic and Non-Diabetic Pancreas," *Journal of Metabolic Research*, January, 1922, page 43.

(11) M. A. Lane: *Ibidem.*

(12) H. G. Wells: *Ibidem.*

ONYX.

By HUGH ARMSTRONG, F.R.C.S. (England),
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IT may be of interest to general practitioners to read a few observations on the subject of onyx. In my experience it is a fairly common disease and, while not often a very serious matter, can under certain circumstances assume a very destructive character. Even the milder cases can make the eye appear angry enough to excite alarm in the sufferer, at any rate. Further, it is a subject upon which very little real guidance is afforded by text-books. Mackenzie in 1854, Sir Herbert Parsons in 1923 and von Arlt in 1885 and more especially the last named great authority, furnish most assistance.

First of all I would say that the term onyx, the Greek work for a finger nail, is by no means appropriate. From start to finish the purulent accumulation is nearly always circular in shape. But there is another meaning to ὄνυξ, that is "something streaked with veins," an onyx and this latter one may be fittingly applied to these cases at the stage when purulent streaks can be seen running from the posterior of the surface opposite the abscess down to the bottom of the anterior chamber. I am aware the latter meaning is not the accepted one. I do not think I have ever seen the typical straight upper and curved lower sagging borders. The reason seems to be that the *substantia propria* of the cornea offers an equal resistance in all directions to the distending power of the accumulating cells; gravity can play but a smal part in a firm, matted structure such as that.

One feature in the structure of the cornea should always be kept in mind and that is its division into three layers: First the superficial which is a direct continuation of the bulbar conjunctiva; the *substantia propria* which is scleral in its association and lastly Descemet's membrane which is related to layers deeper than the sclera.

That there is more than mere tissue continuity involved is suggested by the behaviour of the active lesion and the final appearance, when activity has ceased. The surface layer is probably not nearly so vulnerable as the deeper ones because of the potential vascular assistance obtainable from the conjunctiva. In the early stages with a moderately strong lens the surface layer can be seen passing clear over the front of the minute abscess and when cicatrization has been established, the absolute surface layer can be made out to be quite transparent in many cases, only the deeper portions remaining opaque. Where the abscess has come to the surface or been opened, the reparative substance that fills up the hollow, clears on the surface, but remains opaque below. The same clearing can be followed in cases where a foreign body has been so deeply imbedded in the cornea as to require scraping away. The grey white opaque speck of reparative material that occupies the pit, ultimately becomes quite transparent, though a minute facet is recognizable.

The site of perforation through Descemet's membrane becomes almost clear in many cases. In a case of Mooren's ulcer in which perforation took place in two spots, now after two years the entire cornea is only faintly nebulous and the clearest spots are over the sites of the perforations. It would appear that the nutritive power of the aqueous humour came to the assistance of the damaged Descemet's layer. The persistence of the middle portion of the nebula seems to be due to the fact that it lies between and out of reach of the aqueous and the conjunctival vessels.

There is another factor in the development of onyx that should, I think, be borne in mind. And that is that the superposition of layers of different structural character bears a certain resemblance and carries a certain vulnerability, as does the function of skin and mucous membrane. Transitional cells are often prone to take on aberrant activity. The lines of junction of cells of differing nature are lines of weakness. Given the appropriate stimulus, suppuration or malignant action are possible. The development of onyx, seen from its very commencement, supports this idea of a vulnerable junction line, for it is between the unbroken, clear surface layer and the outer layers of the corneal substance proper that the first speck of opacity can be discerned. Enlargement of the speck, not larger than a pin's head at first, follows and the lamellæ of the *substantia propria* part under the pressure of the accumulating cells. As the severity of the process increases it takes on a lemon coloured tint and the little abscess can be seen extending backwards, usually as though the deeper cells of the superficial layer were more resistant. Hypopion appears frequently as a grey deposit filling in the bottom of the angle between iris and cornea.

Sir Herbert Parsons in the last edition of his book states that this hypopion certainly is not derived from the onyx, but from the ciliary region behind the iris. Such an authority must be respected. But I have many times examined the cornea with a strong glass and found that Descemet's membrane was marked by fine grey lines that sprang from the region behind the onyx and ran down to the commencing hypopion. I have not yet seen any such markings on the front of the iris such as one would expect if the material came from behind that structure and cataracted down its anterior surface.

There are two features connected with onyx with which I have been impressed: First the strong liability to recurrence; secondly the destructive character of the process when associated with albuminuria.

Frequently under treatment an onyx clears up in some two to three weeks. In a month or so another minute abscess appears at the old site or close to it. Several months may elapse since the disappearance of the first abscess and as the result of some traumatic irritation the old cavity refills with grey material which may later on become purulent. It would appear as though the absorption of the original collection left a potential cavity whose walls had not become permanently coherent. When opened, the contents much resemble a mucus that is somewhat granular in character. It evidently takes a considerable time before the walls of the cavity are intimately adherent.

The development of what appear to be very minute vesicles on the surface of the adjacent cornea mark the extension of the process when the abscess has been opened or has burst forwards.

The presence of albuminuria is an unquestionable danger in these cases, for when it occurs, what is usually a quiet and gradual process may become an actively necrotic one. So much has this impressed me that I always test for albuminuria in every case of onyx and, if I find it, give a very guarded prognosis. Of two cases rapid necrosis of the entire thickness of the cornea occurred in one and in the other rapid ulceration traversed nearly the whole cornea and perforation with extrusion of the lens occurred during a severe attack of vomiting. In each case within twenty-four hours of the administration of full doses of iron rapid healing set in. The influence of perforation in the latter case on the process of healing cannot be overlooked.

As to the cause of onyx, a history of a recent blow can nearly always be obtained. The blow is insufficient to break the surface layer, for a bright reflection from it can at first be seen and by oblique illumination the layers underneath are seen to be unaltered. Direct surface infection rarely causes it; corneal ulcer would precede onyx if it did.

As to treatment, I have found dry heat and atropine most useful in the early stage; but should the grey speck assume a yellow tint, then I think it should be opened at once, like an abscess anywhere else. The minute cavity should be scraped and swabbed with a solution of biniodide of mercury one in two thousand. Re-scraping should be carried out if the reparative material show the least yellow tint.

It is remarkable how much clearing of the cornea takes place in four or five months. Patients should be warned of the possibility of recurrence following slight injury such as impact of dust or slight blows. And for that reason it would be wise to wear protecting glasses for several months, until real consolidation has occurred.

Reports of Cases.

AN INTERESTING ABDOMINAL CONDITION.

By H. F. PERKINS, B.A., B.Ch., M.B.,
Mareeba, North Queensland.

MRS. W., a young married woman, aged twenty-seven years, the mother of three healthy children, was operated on for a right-sided tubal pregnancy eighteen months before I saw her. She was also deprived of her appendix at the same time. She told me that two mornings previously she had wakened up with great pain "all over her stomach," that she had got up and promptly fainted. This process had been repeated on the morning I first saw her. She was very anæmic, her pulse was one hundred and ten and her temperature 36.4° C. (97.4° F.). Her abdomen was tense, her muscles "on guard" and there was extreme pain over and below the right iliac fossa as well as definite tenderness. A vaginal examination revealed nothing beyond an aggravation of the pain. She had missed one period by fourteen days, but this she said was quite common since her operation.

She was brought to hospital where my colleague Dr. B. H. Quinn saw her with me. We made no certain diagnosis, but opened the abdomen which was filled with blood and blood clots. The source of the bleeding proved to be a ruptured ovarian cyst on the right side where there was no trace of either tube or appendix. Her left side proved a surprise as there was a tubal pregnancy and another large ovarian cyst. The tube was filled with blood and was on the point of rupture. Both tube and ovary were removed and an attempt was made to leave some ovarian tissue behind. The patient made an uneventful recovery.

I have recorded this case as it must be unusual to find such a pathological museum in the pelvis of one small woman. The presence of a tubal pregnancy was verified at the Pathological Department of the Tropical Institute.

AN UNUSUAL DERMOID.[1]

By WILLIAM TRETHOWAN, M.B., B.S. (Aberdeen),
Honorary Consulting Surgeon, Perth Hospital, Western Australia;
With a Pathological Report
By JOHN DALE, M.D., B.Sc. (Birmingham),
Medical Officer of Health, Perth, Western Australia.

MISS W., aged twenty-four years, was seen in consultation with Dr. Mildred George.

The patient had noticed a gradually increasing swelling of her abdomen and a hard lump low down on the right side which she described as an extra rib. She could not remember when the swelling commenced and stated that her abdomen had always been "big." When seen the tumour was the size of seven and a half months' pregnancy. A very hard mass could be felt low down near McBurney's point, the rest of the tumour was fluctuant. There was no tenderness. There were no fœtal heart sounds and no movements. The breasts were virginal. The diagnosis made was either dermoid cyst or cystadenoma of the ovary.

Operation.

A median incision was made. The cyst was free from adhesions, it did not arise from the pelvic cavity, nor were the uterus, ovaries or Fallopian tubes affected. A coil of small intestine ran across the cyst wall from above downwards and from left to right. This piece of bowel had no mesentery and was closely applied to the cyst wall. The cyst wall below the bowel was thinner than that above.

[1] Read at a meeting of the Western Australian Branch of the British Medical Association on October 17, 1923.

The cyst appeared to spring from about the level of the third lumbar vertebra, it was retro-peritoneal and had grown forwards in the fold of the mesentery. It was tapped below the strip of bowel and about a litre and a half of creamy white fluid drawn off which solidified on cooling and looked and felt like pure lard. Obviously it was a dermoid and the problem was how to deal with it. An attempt was made to separate the cyst wall from the peritoneum near the tapped area, but no progress could be made, the peritoneum and cyst wall were practically one. The aperture was closed and oversewn and an attempt made by dissection to find a line of cleavage above the coil of bowel, but without success. An attempt to remove the whole anterior cyst wall was negatived by the great danger of cutting off the blood supply to the coil of intestine. The idea of resecting the whole coil of bowel was entertained, but in the absence of any line of cleavage was dismissed.

A long incision was now made in the cyst wall and the remaining contents ladled out, about three litres in all. A large mass of felted hair was removed and then a hard elongated mass was felt projecting into the cyst cavity. This was fifteen centimetres (six inches) long by seven and a half centimetres (three inches) in diameter. It was removed by resecting the portion of the cyst wall from which it sprung, afterwards suturing and infolding the opening made. The cyst cavity was cleaned out, packed with iodoform gauze and marsupialized to the upper part of the abdominal wound.

Packing was removed on the third day and the cyst cavity irrigated daily for six days with "Acriflavine" solution. There was no discharge and the whole wound was soundly healed in a fortnight. There is, of course, a danger that the attachment of cyst wall to the anterior abdominal wall may at any time be the cause of intestinal obstruction and the cyst cavity is practically certain to refill. But probably it will do so very slowly (six months after operation no palpable enlargement was present) and it may be years before any inconvenience is felt. I did not like the idea of leaving a drainage tube in permanently, since by doing so the cavity was certain to become septic sooner or later and the presence of a tube and consequent discharge would be a constant annoyance.

Comment.

I think a dermoid in this position is very rare. I have never seen one nor is there any record of one in the literature available. This and the problem of dealing with it is my excuse for bringing the case to your notice.

Pathological Report.

The cyst was filled with sebaceous material and hair. To its wall was attached a tumour of sausage shape, about fifteen centimetres long and seven and a half centimetres in diameter, tapering somewhat to the two ends. At the free end, there was located an oval "mouth" about five centimeters by two and a half centimetres from which five teeth protruded. These consisted of one incisor, one canine, one bicuspid and two molars, somewhat small in size, but perfectly shaped as to cusps and roots, except that the roots of the bicuspid were fused into one large root, as also were those of one of the molars. The roots were firmly fixed in bony sockets. Sections of the teeth showed normal pulp-chambers and root-canals.

Dissection showed that the body of the tumour consisted chiefly of fat. Running through its length was a slender bone, flattened from side to side and of a width of about eight millimetres (one-third of an inch), strongly suggesting a rib. At the fixed end of the tumour this bone was enlarged into a flattened base about 2.5 centimetres by 3.75 centimetres and 1.25 centimetres thick (one inch by one and a half inches and half an inch thick), which was embedded in the wall of the cyst. Towards the free end of the tumour the rib-like bone enlarged into a rounded extremity. The bony walls of the two enlarged extremities were of egg-shell thickness and contained marrow without any cancellous bone. The marrow at the fixed end was fatty, whilst that at the rounded end looked like and proved microscopially to be red bone-marrow.

The teeth were set in the end of a separate piece of bone about five centimetres (two inches) long, 3.75 centimetres (one and a half inches) wide and 2.5 centimetres (one inch) thick. This showed on section a thick outer layer of compact bone and a cancellous interior containing red marrow. Among the tooth sockets was discovered another tooth, miniature in size, with a peg-like cusp of a shape suggesting a canine and a well-formed root.

During the dissection of the rounded end of the rib-like bone it was discovered to be connected with the skin of the tumour by a fibrous canal, suggesting an external auditory meatus in that it was divided by a septum which had the appearance of an ear drum. No ossicles were discovered and the part was unfortunately so much damaged in the dissection of the bone from its tough and greasy environment, that no other details can be given.

Microscopical sections showed that the skin of the tumour contained, as was to be expected, hair roots and greatly hypertrophied sebaceous glands and that the squamous epithelium was rather thinner than that of ordinary skin. The inner surface of the "lip" was lined by a very rudimentary epithelium, arranged in a single and in parts a double layer of cells. No glands were detected in the mouth. A section taken from the neighbourhood of the "ear" showed a single layer of definitely columnar epithelium which appeared to be ciliated.

Other tissues seen in section comprised normal-looking connective, fatty and fibrous tissues, blood vessels and here and there what appeared to be nerves.

Reviews.

THE PRACTICE OF RADIOGRAPHY.

THE first volume of the fourth edition of "Radiography and Radio-Therapeutics" by Robert Knox is to hand.[1] It contains new matters in relation to radiography of gall bladder conditions and of the urinary tracts. Beyond these chapters very little alteration from the other editions is noticeable. In this volume the author deals first with the various types of apparatus, he then describes the production of the skiagram and lastly considers the interpretation of the various morbid conditions. In the description of apparatus much obsolescent machinery is described, while the description of the modern high tension transformers is rather scanty. It is somewhat surprising to find that the author still uses gas tubes so extensively and that in mastoid conditions he states that it is necessary to change tubes between exposures; he does not mention the possibility of carrying out this class of work by Coolidge tubes. The description of stereoscopic radiography is lucid and instructive. Sweet's new method of localizing foreign bodies in the eyeball is described in detail in addition to a full description of the older method. A very important chapter is devoted to the development of the bones with details of ossification and epiphyseal union and the illustrations of the various stages are wonderfully clear; in fact the illustrations in this section and in the section on bone and joint injury and disease should be of untold value for reference. In the chapter on gall stones the author is not over enthusiastic about the results at present obtainable and while it is impossible to demonstrate all gall stones outside the body, he does not think it possible to demonstrate them *in situ*. The value of careful preparation of the patient is emphasized, both purgatives and enemata being employed. Antero-posterior, postero-anterior and lateral radiograms are taken and rapid exposures are necessary in order to obliterate movement. In the section on the examination of the urinary tract the author recommends screen examination as a routine and later admits that he rarely uses screen examinations himself. Here we still find the gas tube in use and the Coolidge tubes referred to as offering a simpler method for obtaining uniform skiagrams. The appendix contains a reprint of the recommendation of the

[1] "Radiography and Radio-Therapeutics," by Robert Knox, M.D., C.M. (Edin.), M.R.C.S. (Eng.), L.R.C.P. (Lond.); Fourth Edition; Part I.—Radiography; 1923. London: A. and C. Black, Limited; Royal 8vo., pp. 473, with 92 plates and one coloured plate and 337 illustrations in the text. Price: 40s. net.

X-ray and radium protection committee for the protection of operators and patients.

The book may be looked upon as the standard English work on radiography and the excellent illustrations, if used for reference, should often aid radiologists in the interpretations of unusual conditions.

ACUTE INTESTINAL OBSTRUCTION.

IN "The Toxæmia of Intestinal Obstruction" Dr. Paramore introduces an interesting subject for speculation and a field for further research.[1] The author bases his discussion upon the experiments of McQuarrie and Whipple, who artificially obstructed the intestines in dogs, demonstrating a consequent impairment of kidney function. This impairment was manifested by a failure of the dogs to excrete non-protein nitrogen and a rise of non-protein nitrogen in the blood. This phenomenon they regarded as due to absorption of a toxic proteose from the obstructed bowel.

Dr. Paramore rejects this conclusion on the grounds that absorption from the obstructed intestine is delayed and that the toxæmia is evident in dogs which had been starved for three days prior to the experimental production of obstruction.

He notes that vomiting occurs in these experiments as a preliminary to the increase of non-protein nitrogen in the blood. He concludes that vomiting is "the pathological force" which impairs renal function by greatly raising intra-abdominal pressure. Thus the renal impairment is the cause and not the result of the toxæmia of intestinal obstruction.

While we may not agree with him, his monograph is an attractive contribution to the study of the subject.

THE ORIGIN OF MAN.

IN his Douglas Price Memorial Lecture, 1923, entitled "The Ancestry of Man," Professor Wood Jones has returned to the attack in support of the tarsian hypothesis of the origin of man.[2] In 1918 Professor Wood Jones subscribed to the view that man on the one hand and monkeys and apes on the other were collateral descendants of a group of animals of which *tarsius spectrum* is a direct living descendant. He further contended that the lemurs were not the ancestors of the tarsioids. This attack upon the Linnean classification has led in the last four years to several extensive publications in defence of the more widely accepted view. This may be called the simian hypothesis of the origin of man, in which tarsius is regarded as the origin of a main stem leading to man from which the monkeys and apes diverged. These publications and Professor Wood Jones's first paper should be read in conjunction with the present lecture in order that the relative value of the evidence presented might be clearly followed by the reader.

The line of argument adopted by Professor Wood Jones in defence of his thesis, is in the first place to insist that the same rules should hold in determining the relation of man as in the case of any other animal. He then mentions that similarity in anatomical characters in different forms may be due to habitus as in convergence in groups of widely different heritage. But he argues (page 11) that "one fundamental structural difference begot of heritage outweighs many structural resemblances begot of habitus." He then points out (page 13) that magnitude does not determine a fundamental character; it may be apparently trivial and examples of such distinctions follow (pages 14 to 19). Applied to the question at issue, the author cites two characters, regarded by him as fundamental, in which the human skull differs from those of the anthropoid apes with the exception of the orang, *videlicet* the temporo-frontal articulation at the pterion and the frontal pre-sphenoidal articulation in the anterior cranial fossa which excludes the mesethmoid from articulation with the pre-sphenoid, are present in the apes but absent in man. They are also absent in tarsius. Hence he argues that man evolved from tarsius separately from the apes which have developed these specializations. He believes the orang which sometimes exhibits the human condition, "to be the animal nearest to the point of departure of the simian from the pro-human stem" (page 30). The author's viewpoint stands or falls according to whether these two characters on which he alone relies on this occasion, are to be regarded as fundamental or not. Little evidence is given in support of this conclusion and the comparison made (page 27) between the importance of these characters when set beside two minor points of resemblance extracted from an exhaustive treatment of this subject by Dr. W. K. Gregory, is unjustifiable.

The author calls attention (pages 31, 32) to the incompleteness of the palæontological record of man's ancestry and notes how great a part the anatomical characters of teeth necessarily play in determining the relationships of the primates. The example of the difference of opinion which may arise in such work in regard to the divergent views of Dr. Smith Woodward and Dr. Henry Fairfield Osborne upon *Hesperopithecus haroldcooki*, loses force in view of the fact that the former had not examined the material itself and depended for his judgement upon diagrams and photographs. It may be noted in passing that the illustration of the fossil animal referred to by the author, as being reared on evidence consisting only of a single water-worn tooth, was distinctly stated by Professor Elliot Smith who wrote the accompanying article, to be the product of the imaginative genius of the artist. The author quotes Elliot Smith (page 34) in order to illustrate that there is a tendency to accept his views. The statement quoted does not touch the fundamental point of Professor Wood Jones's thesis, *videlicet* that two stems have branched upward from the tarsius group, for it is equally compatible with the view that the apes have diverged from a single straight line which has led to man. That the latter is still Professor Elliot Smith's view, is shown by later writings than that quoted, *exempli gratia* *The British Medical Journal*, July 22, 1922, page 146.

DERMATOLOGY.

OF the smaller books on dermatology "Diseases of the Skin" by F. C. Knowles can be recommended to both students and general practitioners, chiefly on account of the excellence of the numerous illustrations most of which are taken from actual photographs.[1] When the author has been unable to obtain a good picture, typical photographs are illustrated which have been lent by the courtesy of other well known dermatologists.

The various tables also are very clearly set out. They indicate the main points in the differential diagnosis of certain diseases and will be useful to those who are not specialists in skin diseases.

The book is divided into thirteen classes, the last—that of the acute infectious diseases—is a very necessary chapter, sometimes omitted in works on dermatology.

Over forty pages are devoted to syphilis, but no mention is made of the various bismuth preparations now on the market for its treatment.

With regard to the treatment of *tinea tonsurans* it may be argued that to epilate by X-rays only a portion of the scalp is wrong. After epilation of the whole scalp, however, the infection is often seen to be more extensive than supposed. It would thus appear necessary to epilate the whole scalp.

The fact that the book is in its second edition is evidence of its popularity in America.

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[1] "The Toxæmia of Acute Intestinal Obstruction," by R. H. Paramore, M.D. (Lond.), F.R.C.S. (Eng.); 1923. London: H. K. Lewis and Company, Limited; Crown 8vo., pp. 74, with one chart. Price: 5s. net.

[2] "The Ancestry of Man," by Professor F. Wood Jones, Adelaide, Being the Douglas Price Memorial Lecture, No. 3; 1923. Printed for the Trustees by R. G. Gillies and Company, Limited, Brisbane; Post 8vo., pp. 35.

[1] "Diseases of the Skin," by Frank Crozer Knowles, M.D.; Second Edition, thoroughly revised; 1923. Philadelphia and New York: Lea and Febiger; Demy 8vo., pp. 610, with 229 illustrations and 14 plates. Price: $6.50 net.

The Medical Journal of Australia

SATURDAY, MAY 31, 1924.

The Complement Deviation Test in Tuberculosis.

In 1903 Bordet and Gengou demonstrated a phenomenon which has led to the discovery of many and varied reactions in connexion with infective processes. To the fresh serum of a guinea pig Bordet and Gengou added the heated serum of a rabbit which had previously been treated with an extract of a bacterium, and an extract of the same bacterium. This combination was added to a hæmolytic system, that is the heated serum of a rabbit pre-treated with sheep's blood corpuscles and a suspension of the same corpuscles. They found that no solution of the corpuscles occurred provided the amount of fresh serum was not greater than the minimum required to dissolve the quantity of corpuscles. According to the hypotheses of Ehrlich, Bordet and other workers normal serum contains a substance called complement or alexin or manifests a quality recognized by the completion of the phenomenon of hæmolysis. In the Bordet-Gengou phenomenon the first combination exhausts all the complement or complementary action, so that none remains over to act on the red blood cells and to produce hæmolysis.

Wassermann and his co-workers endeavoured to apply the Bordet-Gengou phenomenon to tuberculosis. They experienced considerable difficulty, however, and turned their attention to syphilis. Owing to the impossibility at that time of obtaining cultures of spirochætes they used an extract of a fœtal syphilitic liver. It was afterwards found that the reaction occurred if an extract of heart was used in place of the syphilitic liver or even if a solution of lecithin was substituted. It thus appears that a lipoid combined with some biological reaction product of lipoid is capable of destroying complementary action. After consideration has been given to these facts, it will be evident that the Wassermann reaction is essentially different to the Bordet-Gengou phenomenon.

Latterly as a result of the undoubted value of the Wassermann reaction and of increased knowledge and better understanding of the processes involved the attention of workers has been claimed in an endeavour to place completment deviation in tuberculosis on a satisfactory basis. These efforts, though successful up to a certain point, have not been crowned with the success which was anticipated. A certain divergence of results has been obtained and this may to a large extent be explained by the difficulty in finding a suitable antigen. The term antigen is used here without prejudice, even though it may ultimately be proved that the biological process of a protein-antibody combination is not involved.

Many antigens have been used in the performance of the test. The type of antigen most naturally chosen and perhaps the most effective has been one in which an extract of whole tubercle bacilli is included. Sometimes other acid-fast bacilli have been employed. Suspensions of tubercle bacilli in saline solution or in glycerinated saline solution have been used; some observers have used living, virulent bacilli and others killed organisms. Others again have used broth cultures of tubercle bacilli. It has been claimed by Rogers and others that the best antigen from the theoretical point of view is a suspension of living, virulent tubercle bacilli. Coulthard has made a special point of investigating this aspect of the question and has failed to find any difference in the antigenic properties of living and dead bacilli. Bryce reported at the Australasian Medical Congress (British Medical Association) that of the four antigens used by her that composed of dead tubercle bacilli was the most effective. Her list of four did not, however, include living bacilli. Another type of antigen that has been used, is that consisting of preparations rich in tubercle bacilli, such for example as a suspension in saline solution of nodules from the peritoneum of an animal suffering from tuberculous peritonitis. A third type of antigen is that known as a partial antigen. In this variety fractions of the bacillus are extracted by various chemical means.

Thus the lipoids may be extracted by alcohol and the extract used as an antigen. Kurt Meyer claimed that he obtained satisfactory results by this method. Again in the preparation of Dreyer's partial antigen the lipoids have been extracted with ether and the acid-fast properties have been removed with the chitinous-like envelope by means of acetone. Badham has recently stated that he has found Dreyer's antigen equal in value to living tubercle bacilli in the performance of the test.

The results obtained by any of these antigens leaves something to be desired. The reaction fails sometimes in the serum of individuals whose clinical condition must obviously be diagnosed as tuberculosis. In regard to the reliability of the test it has been pointed out by many observers that psuedo-reactions are often obtained with the sera of syphilitic patients. It would appear that this is more liable to happen when the test is carried out by the ice-box method than when the Harrison method is used. Unfortunately the ice-box method is that which gives a higher percentage of reactions in any complement deviation test. Coulthard has been more fortunate. He has stated that in his series neither suspension of tubercle bacilli nor alcoholic extracts have caused fixation of complement with the sera of syphilitics who showed no evidence of tuberculous infection.

It will thus be seen that there is still some divergence both of methods and results obtained. The claims and counter claims of investigators could be multiplied considerably. Tebbutt in discussing the question pointed out that the Wassermann reaction and complement deviation in tuberculosis are not altogether parallel. He said that the Wassermann reaction was a measure of immunity rather than of infection and that the response of the patient diminished under specific treatment. Complement deviation, on the other hand, is said to be intensified by specific therapy. Much more work is needed in the testing and retesting of persons known to be infected by tuberculosis and allied conditions. If this is done and the results are carefully studied, useful knowledge will be gained and a definite place assigned to the complement deviation test in the diagnosis and treatment of tuberculosis.

Current Comment.

ANTI-TUBERCULOSIS DISPENSARIES.

IN his charming story of the plague which overwhelmed Florence, the fairest of all the cities of Italy, in 1348, we are told by Boccaccio that "the malady seemed to set at naught both the art of the physician and the virtues of physic; indeed, whether it was that the disorder was of a nature to defy such treatment, or that the physicians were at fault—besides the qualified there was now a multitude both of men and of women who practised without having received the slightest tincture of medical science—and, being in ignorance of its source, failed to apply the proper remedies; in either case those that recovered were but few." With important qualifications these remarks of the great romancer of the Italian Renaissance may be applied to the subject of pulmonary tuberculosis in these latter days. That mysterious person known as "the man in the street" views this disease as an incurable complaint "setting at naught both the art of the physician and the virtues of physic." An army of charlatans exploit the afflicted public with make-believe nostrums. To a degree the profession appears nonchalant or luke-warm and though no longer ignorant of its source yet "fails to apply the proper remedies."

The attitude of the profession is not intentionally supine. In Australia the study of pulmonary tuberculosis has by no means been neglected and at the recent Congress no subject received or merited more concentrated attention. The trouble lies in the disagreements as to the mode in which the tuberculosis problem should be attacked. All are agreed that fresh air, good food, suitable clothing and reasonable leisure for all—a modern Utopia—would greatly reduce or destroy the incidence of the disease. In his evening meditations the physician may with that natural optimism characteristic of the human race see these good things fulfilled. But when he rises in the morning he finds himself a slave to the time spirit—a subject of civilization with its cities, its factories, its tenements and its basic wage! We mention the basic wage because, whether or not the medical man believes that the fixation of a wage by law insures to the workman in the most equitable way a reasonable reward for a fair day's work, he must agree that it has destroyed—perhaps for ever—that haven of the tuberculous artisan known in history as "a light job." Robbed of this chance of earning an honourable pound or two a week, the tuberculous worker—and with him a host of convalescents and victims of partially crippling diseases—bears his enforced poverty silently or throws himself on the mercy of the State.

But taking our social system for granted, the profession still finds itself divided on the tuberculosis problem. Our efforts are various and divergent. There is no central scheme of attack, no plan of war. Some place their hopes in some species of tuberculin, others in sanatoria, others in hospitals for specialized diagnosis and treatment, others in

farm colonies and others in a salutary mixture of these. In recent years the anti-tuberculosis dispensary has won great favour. Working unobtrusively, without blare of trumpet or flare of pennon, it gathers in the suspect, sifts the infected from the more fortunate, applies to the former the advantages of modern treatment and through the medium of the visiting nurse carries comfort into the home of the tuberculous and with it the blessings of a specialized education in hygiene.

We gather from an article by Professor A. Gaussel, of the Medical Faculty of the University of Montpellier,[1] that the Government of France instituted a series of anti-tuberculosis dispensaries in that country by an Act of Parliament passed in April, 1916. The Professor has sufficient faith in these institutions to believe that they marked the beginning of the first concerted struggle against tuberculosis in that land. As technical adviser to one important group of dispensaries, he confesses, however, to one big disappointment. He is conscious of an attitude of coolness, not to say antagonism, on the part of general practitioners, to his organization. The family doctor holds aloof. He has found that the dispensary, once a patient has been persuaded to come under its care, absorbs him in perpetuity. He has found also that the dispensary officials do not question applicants for treatment too closely as to their financial standing. The result is that the physician in practice is not only deprived of the honour of treating the destitute (a privilege which might be resigned without dishonour), but he is also compelled unfairly to suffer financial loss to the advantage of the well-to-do.

This antagonism on the part of the profession Dr. Gaussel understands and deplores. He understands the justice of the plaint. He deplores the circumstances which force the practitioner into hostility. Without the cooperation of the family practitioner, the dispensary cannot hope to do its best. Very often he alone can persuade suspect patients to apply for examination at the institution, he alone can coax contacts of the tuberculous to a recognition of the advantages of investigation which the dispensary affords and he alone is in a position to give important information as to the family history, habits and adherence to advice given by the dispensary physicians.

To remedy this unfortunate lack of collaboration, Dr. Gaussel suggests that the dispensary should constitute a diagnostic and not a therapeutic service. It should confer with the practitioner in the eliciting of all facts relating to the medical or hygienic life of the patient and delimit its activities to the establishment of a diagnosis and to individual and familial prophylaxis. The entire treatment of the patient should be the prerogative of the practising physician, except in the case of the indigent and then only with the implied or actual consent of the recommending practitioner. Every patient who applies at the dispensary should be classified quickly into one of three categories, to wit, the non-tuberculous, the tuberculous with bacilliferous sputum and the doubtfully tuberculous or tuberculous with sputum from which tubercle bacilli are absent. Patients of the first group are discharged and return for examination when suspicious symptoms present themselves. Those of the second category are instructed in the principles of personal and domestic prophylaxis and are persuaded to enter sanatoria or similar institutions. If the patient elects to remain at his own home, the rôle of the dispensary physician is almost ended. That of the visiting nurse working in collaboration with the family physician commences. The patient may, on the advice of his medical attendant, return to the dispensary for further bacteriological or radiological examination or for a specialist's opinion on his progress or for entry to a sanatorium *viâ* the anti-tuberculosis dispensary. Patients of the third class include the huge company of the suspect. M. Gaussel agrees with Sergent and Rist that among them the pseudo-tuberculous are legion. Like the camp-followers of an army, they encumber the dispensary and largely destroy its efficiency. The author believes that within two months it should be possible to classify them as definitely tuberculous or to eliminate them.

Lastly he pleads for the recruiting of trained nurses, kind, tactful, business-like and temperamentally fitted for this trying and responsible work; and for medical men, free from the tarnish of officialdom, clinicians in the broadest sense and not mere one-sided specialists in phthisiology. The study of tuberculosis cannot be torn from general medicine without blood. Projected legislation on national insurance for France strikes this fear into Dr. Gaussel's soul. The dispensary system will sooner or later gain more favour in Australia and we would do well to consider long these words.

[1] *La Presse Médicale*, January 16, 1924.

PREGNANCY AND ECTOPIC GESTATION.

AN interesting example of successful conservative surgery has recently been reported by Mr. F. Winson Ramsay.[1] A female patient, aged fifty-seven years, had her left tube and ovary removed in 1918 on account of a ruptured tubal pregnancy. In 1920 she suffered from uterine bleeding occasioned by a pregnancy in the right tube. After having explained the position to the patient Mr. Ramsay opened the tube, removed the contents and closed it with a continuous suture. The patient subsequently became pregnant and was delivered of a female child at full term in 1923. Mr. Ramsay suggests that salpingotomy should be practised more largely in similar conditions. He thinks that the history of this case suggests that the tube may not be at fault or that the fault is not a permanent one. Even though Couvelaire regarded the embedding of a fertilized ovum in the tube as a pure accident, most surgeons will agree that the danger of further gestation in the same tube after salpingotomy is considerable. Mr. Aleck Bourne in discussing Mr. Ramsay's report referred to a patient in whom interstitial pregnancy occured after similar treatment. The patient died from hæmorrhage.

[1] *Proceedings of the Royal Society of Medicine*, April, 1924.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Compensation in Ocular Injury.

A. C. SNELL (*Archives of Ophthalmology*, January 1, 1924) analyses the factors which should be a guide in estimating the loss of earning ability and in fixing compensation for injury to one or both eyes. Earning ability (E) depends upon three elements: Functional ability (F), technical ability (T) and competitive ability (C), but as each one is essential to earning ability, the latter must represent their product and not their sum. Hence $E = F \times T \times C$. Technical ability (T) is never changed except in brain injury or disease and in most cases may be omitted. Hence $E = F \times C$. Functional ability is the most important as blindness is total working incapacity. Loss of one eye is generally considered one-fifth as serious as loss of both eyes. The visual function (F) depends upon three elements: visual acuity (P), field of vision (A) and muscular movements (M). Each of these is essential to normal visual function, so in an equation they must be factors. But they are not equally important. Allow visual function to vary as the square root of field function (A), the equation is $F = P \times \sqrt{A} \times M$. So introducing the coefficients affecting F we have earning capacity, $E = F (P \times \sqrt{A} \times M) \times C$.

Reform Diet in Ophthalmic Practice.

G. H. BELL (*American Journal of Ophthalmology*, February, 1924) insists upon the importance of the "three T's"—teeth, tonsils and toxæmias of the intestinal tract—in the treatment of eye diseases. As a potent cause of intestinal toxæmia he blames the prevalent custom of mixing starchy and protein foods at the same meal. Meat foods are digested in the stomach, starch and sugar in the duodenum and small intestine. Their presence together in the stomach delays digestion and sets up putrefaction and the formation of toxins. His reform diet aims at separating these elements and confining one meal to carbo-hydrates and another to meats of any kind or eggs and cheese. Acting on these principles, he has obtained good results in many eye conditions which have resisted treatment. Especially does he mention the importance of this diet in glaucoma.

Holes in the Retina.

W. LISTER (*The British Journal of Ophthalmology*, January, 1924) publishes an article dealing with the presence and causation of muscular and retinal holes. There are some points of value in the diagnosis of ocular neoplasm and as affecting the question of operation for detached retina. Leber says that sudden detachment of a retina cannot occur without the production of a hole. The detachment associated with a neoplasm does not show a hole in the retina. Hence sudden detachment or the presence of a hole is a contra-indication to the presence of intra-ocular tumour. Detachments caused by the dragging of a shrinking vitreous and those associated with a retinal hole offer little prospect of cure by operation.

Operation for Ptosis.

R. G. REESE describes another operation for ptosis (*Archives of Ophthalmology*, January, 1924). A skin incision is made along the lid margin six millimetres above in the centre and four millimetres above at the sides. The skin is reflected four millimetres above and two millimetres below. The underlying tissue is incised by two curved incisions meeting at each extremity and leaving a central portion measuring six millimetres vertically. The two ends are dissected towards the middle forming two flaps and leaving ten millimetres still attached in the centre. A small incision is made above the eyebrow and a knife worked down to the original opening. With a needle and suture each flap is drawn through above the eyebrow and fixed. This is done on each side. The central piece is also drawn upwards by a two-needled suture emerging in the centre above the eyebrow.

A Conjunctival Flap in Cataract Extraction.

J. WOLFF (*Archives of Ophthalmology*, November, 1923) describes his own method of making a cunjunctival apron or safety flap in cataract extraction. Two points are selected on the limbus which include between them the upper fourth of the circumference. From these points two horizontal incisions, two millimetres in length, are made and from the extremities of these diverging oblique incisions extend upward. The flap is separated along the limbus and undermined sufficiently to enable the flap to be brought down by sutures without undue tension. The points of anchorage for the flap are located where vertical lines from the first two selected points cross the power limits. The sutures are put in place and the first loop of the knot made. They are turned aside leaving a particularly clean field for the corneal section and all stages of the extraction. They are removed on the fifth day.

Iridectomy in Glaucoma.

E. TOROK (*Archives of Ophthalmology*, November, 1923) considers that the failure of iridectomy in the relief of glaucoma is due to the defective technique of the conventional operation in which the root of the iris cannot be properly removed. His incision is made with a Graefe knife and includes a conjunctival flap. The conjunctival flap is then grasped with a forceps and pulled down making the wound to gape. With an iris spatula held against the sclera, the root of the iris is detached throughout the whole length of the wound and if so desired the spatula can easily be pushed still further forward between the ciliary body and sclera as far as the supra-chorioidal space. With the assistant holding down the conjunctival flap, the iris forceps is introduced parallel with the wound, one blade being placed near the root of the iris, the other a few millimetres below. The iris is drawn out forwards and slightly downwards and excised with two sweeps of the scissors. These are held parallel with the wound and slightly tilted so that one blade is actually in the anterior chamber.

Visibility of Corpuscular Elements in the Aqueous.

R. VON DER HEYDT (*American Journal of Ophthalmology*, October, 1923) describes his observations on the aqueous with the slit lamp. The focal light bundle of the lamp discloses the normal aqueous as an optically empty fluid. The addition of corpuscular elements such as leucocytes, pigment cells, erythrocytes, granules and other cell débris to aqueous is plainly visible in the bundle of light. These elements when not in excess demonstrate the normal circulation of the aqueous which rises near the warm iris and descends near the colder cornea. A study of these elements may be made in cases of irido-cyclitis. Their very presence is useful in the diagnosis of irido-cyclitis in its early stage. Pigment cells and granules are seen in the aqueous of older persons—senile depigmentation. The particles are seen to ascend in the posterior two-thirds of the aqueous and descend close to the cornea often attaching themselves to its posterior surface. In the early days of traumatic irido-cyclitis there is often a rigidity of the cell-laden aqueous with rich deposits on cornea and lens. As absorption progresses the circulation improves, indicating a good prognosis. In endogenous irido-cyclitis the condition of rigidity occurs in a later stage.

Hernia of Orbital Fat.

W. S. FRANKLIN AND W. D. HORNER (*American Journal of Ophthalmology*, August, 1922) relate the case of a boy, aged five and a half years, suffering from a kidney shaped mass beneath the conjunctiva in each eye, dating from birth. The birth had been instrumental. A diagnosis of hernia of orbital fat through a rupture of Tenon's capsule was made and verified by operation. The masses were exposed by a conjunctival incision, freed and ligated and excised. The slit in the capsule was sutured.

LARYNGOLOGY AND OTOLOGY.

Naso-Pharyngeal Dilatation.

GEORGES GAUTIER (*La Presse Médicale*, February 13, 1924) recommends a method of naso-pharyngeal dilata-

tion for increasing the permeability of the upper respiratory passages especially in children up to the age of fifteen. He claims that the nasal canal lends itself to a progressive painless dilatation, that this by its mechanical action and osmotic power stimulates the mucosa and prevents the accumulation of secretions. By its physiological and vasomotor action it flushes the lymphatic channels—a powerful reflex-therapeutic agent. Naso-pharyngeal dilatation aerates the lachrymal duct, the accessory sinuses and the Eustachian tubes, increases the naso-pharyngeal resonance and gives comfort. He uses two types of bougies made of rubber. One is twelve centimetres long with a conical and slightly flattened end. In section it is an isoceles triangle with the base below. Its extremity is curved at an angle of 30°. The second type is ten to twelve centimetres long with a longer curvature of 30°. In shape it is flattened with the broader part below. It is hollow to allow of dilatation. The nose is cleansed before their employment. One, two or three bougies of different sizes can be employed at each treatment and left in five or ten minutes.

Brain Abscess of Otitic Origin.

WILLIAM SHARPE (*New York State Journal of Medicine*, February 8, 1924) states that the sub-dural collections of pus occurring in localized suppurative meningitis of otitic origin are usually well walled-off from the sub-dural and sub-arachnoid spaces and simple dural drainage permits an excellent recovery. If such a lesion is suspected, an early examination of the cerebro-spinal fluid should be made for increased cell count. There are varying signs of meningeal irritation. Ophthalmic examination rarely shows a definite increase of intra-cranial pressure unless the abscess is a large sub-tentorial one of such a size as to cause a partial blockage of the aqueduct and therefore of the ventricles. If there is concrete evidence of a sub-dural abscess in any area of exposed dura or if a diseased portion of dura is definitely adherent to the adjacent cortex with or without demonstrable neurological signs of a sub-cortical lesion, a small opening should be made in this area and a blunt puncture needle inserted. The author deprecates the use of a knife or sharp needle unless the dura is first opened carefully to ascertain the presence or not of an underlying supra-cortical vessel and to determine whether or not the dura is adherent to the adjacent cortex. Also, unless there is unmistakable evidence of the presence of an abscess adjacent to the exposed otitic dura it is safer and more surgical to explore the suspected temporo-sphenoidal lobe through the clean sub-temporal area, or in the case of the cerebellum, the sub-occipital area. The author considers that the mortality in these abscesses is lessened by early drainage. He employs double glass tubes, one within the other and with end and lateral openings, so that the outer tube can be secured to the scalp with plaster and always left *in situ*, whereas the inner tube can be daily removed. In selected patients, not *in extremis*, it is advisable to perform the operation in two stages, at the first removing the bone, opening the dura and pricking the arachnoid with a small needle over a small area, at the second one or two days later the cortical exploratory puncture is done.

X-Ray in Œsophageal Cancer.

MILES F. PORTER (*Journal of the Indiana State Medical Association*, September 15, 1923) reports the case of a male, *ætatis* seventy years, with adeno-sarcoma of the œsophagus who was treated by X-rays. He had had dysphagia for fourteen months. He received ten three-hour applications of radium treatment totalling thirty hours. Fifty milligrammes of radium were used with one millimetre brass and 0.5 millimetre aluminium filter with each treatment. During this time the patient was gaining in weight, his appearance had improved and he was having slightly less difficulty in swallowing. To the last three-hour period of radium treatment was added X-ray treatment. Of this he had three exposures: one anterior, one posterior and one lateral. Each treatment consisted of one hour exposure at a focal distance of fifty centimetres. The spark gap was 31.25 centimetres (twelve and a half inches). A current of five milliampères was used with a filter of one millimetre aluminium and 0.75 millimetre of copper. Within four days of the inauguration of the combined treatment the patient complained of weakness. Thirty days after the last X-ray exposure he died suddenly in bed. Autopsy revealed a carcinoma involving the lower end of the œsophagus with regional metastases in the mediastinal glands. The author thinks that death was accelerated by the effect of the X-ray on the cardiac muscle, as in another instance rapid failure of the vital powers ending in death followed treatment for mediastinal cancer. The histological picture showed the cancer cells to have been destroyed in the immediate vicinity of the radiated area.

The Lingual Tonsil.

FROM observations made on fifty-three patients with symptoms directly tracable to the lingual tonsil and in the majority of which no other discoverable lesion of the respiratory tract was discoverable, J. Arnold Jones (*The Journal of Laryngology and Otology*, September, 1923) states that in all instances the neurotic element was present in major or minor degree. Alimentary or bowel trouble was complained of by patients and in three a history of gout or rheumatism was elicited. Three female patients were benefited by ova-mammoid substance. The author employs an oily spray with menthol, eucalyptus and camphor and usually a tri-weekly application of a one in forty solution of silver nitrate for three or four weeks to the lingual tonsil. If this does not suffice, he cauterizes the organ and produces several light scars at each of several sittings. In dealing with considerable hypertrophy, he employs the guillotine. Constitutional treatment may be needed and the neurosis combated with zinc and valerian, potassium bromide and in the case of women, ova-mammoid substance.

Electro-Coagulation of Tonsils.

FRANK J. NOVAK (JUNIOR) employed the electro-coagulation method of treating diseased tonsils in one hundred patients and concludes that the method is entirely inadequate and unsatisfactory (*The Journal of the American Medical Association*, June 23, 1923). The pain was excruciating in all instances, there was great difficulty in swallowing—much greater than after tonsillectomy, the palate was extremely œdematous and speech was impossible. The intensity of the reaction persisted through the sixth day.

Maxillary Antrum Puncture.

J. A. BACHER (*California State Journal of Medicine*, October, 1923) reports the case of fatal air embolism after puncture of the maxillary antrum in a man aged forty years. A straight trocar was placed through the inferior meatal wall into the sinus, air was forced through the trocar, the patient collapsed and could not be resuscitated. Autopsy revealed that the right ventricle and conus of the pulmonary artery were filled with a foam of air and blood. Bowen in 1913 and Meugebauer in 1917 reported deaths after antrum puncture. Bacher now applies suction to the trocar-cannula before introducing liquid into the antrum. Some air is blown through afterwards to clear the antrum of fluid.

The Larynx and X-Rays.

A. VAN ROSSEM (*The Journal of Laryngology and Otology*, September, 1923) reports the history of a girl, aged twenty years, who, while undergoing X-ray treatment for lymphomata of the neck, became hoarse; the mucosa of the larynx was swollen, but there was no tuberculosis. After some weeks the voice became normal. Six years later hoarseness again supervened. In the interval she had had frequent treatments by X-rays for ulceration of the skin of the neck. The ulcers healed, but the skin had become thin and the cervical tissues very solid. The hoarseness persisted for some months. A year later she was admitted to hospital for dyspnœa which disappeared, but she died of pneumonia after three weeks. No tuberculosis was found by *post-mortem* examination, but there was caries of the *os hyoideum* and the cartilage of the thyreoid was destroyed. Microscopical examination revealed laryngeal perichondritis, but no tuberculosis.

British Medical Association News.

MEDICO-POLITICAL.

WE have been requested by the Council of the Queensland Branch of the British Medical Association to publish the appended memorandum on national (medical) insurance. Copies of the memorandum have been forwarded to the Royal Commission on National Insurance and to the Federal Committee of the British Medical Association in Australia.

Memorandum—National (Medical) Insurance.

The high standard of medical practice, at least in British communities, is ultimately the product of two factors: (i.) The intimate personal relation between doctor and patient; (ii.) voluntary hospital service based on competitive appointment.

The practice of medicine is just as much an art as it is a science which explains and is really the basis of the personal relation.

Payment of medical practitioners on a contract system is just as opposed to this idea as would be similar payment of painters or musicians who by common consent and tradition have a right to expect as high remuneration as they can get according to the excellence of their work. The better qualified and more experienced the practitioner, the more he may demand and his services are sought, it may be believed, more for his personality than for the commodity he sells. Contract practice evidently predicates the idea of medical treatment as a commodity which it is not, any more than it is even a series of experiments on a dead level of pure science. Contract must therefore inevitably lead to deterioration of service and that this is so is universally admitted. Intellectual pride forbids the best talent working on such lines. If this is so, national insurance on the English plan must result in a levelling down of talent rather than an improvement. If, therefore, the State wishes to spend money for the relief and prevention of disease, it follows that any scheme must be based on the following principles:

(1) That there be no interference with already existing personal relation. That is to say, that patients, except the indigent, must be free to choose their own attendance on the one hand and practitioners must be free to use any methods and charge any fees they think reasonable on the other, just as in the past. It would then remain to decide how any scheme of insurance payments could be devised. Direct *per capita* payments on behalf of patients to doctors being excluded as radically unsound, patients would, as in the past, be directly responsible for payment of fees. This responsibility varies with the patients' means.

For the purpose of this inquiry patients may be divided into three classes: (*a*) Those unable to pay anything—a very small class; (*b*) those in circumstances which allow them to pay all medical (including consultation and specialist) fees and private hospital expenses; (*c*) the large class intermediate between (*a*) and (*b*) for whom some measures of relief are certainly demanded. This is the class, very numerous it is, which bears the whole brunt of hard social conditions. They are willing but unable to pay for the best medical attention and nursing, but are in the majority of cases unwilling on grounds of pride or scruple to use free public hospitals. They are as a rule industrious, thrifty and anxious to educate their children well.

Their case and that of class (*a*) can be met by a system of subsidies or insurance, altogether unconnected with the medical profession, administered by officials having no control over or relation whatever with doctors except, as later provided, such as would be directed toward preventing or suppressing imposition. This is to say, if necessary the State might help persons who on inquiry would be found deserving, to purchase sickness and accident insurance policies, just as is done by ordinary thrifty persons now. Any objection to a self insurance scheme would involve an admission that persons may demand as a right medical attention free or at a reduced rate by contract, when as a fact it is their duty to provide against sickness just as against any other contingent liability. Doctors would render accounts in the usual way and patients would draw on their policies for payment. Sickness insurance policies, as well as hospital insurance policies, as later provided for, would then be obligatory for people who do not belong to lodges. To prevent abuse, patients should be required to consult doctors in their own area or in the alternative be not allowed to draw on policies for mileage rates to be paid to a doctor called on unreasonably long distance to attend them.

Special consultations would be covered by policies only by consent of the insuring office and all fees payable under policies would be subject to tax by an agreed authority. The indigent would have to be covered apart from any scheme of this nature and it is suggested that they be instructed to apply to the police who would report their case to the proper authority with a view to getting attention to be paid for directly by the State.

Midwifery for the purpose of this scheme would be regarded as sickness which relieves the married man at the expense of the bachelor.

This scheme safeguards the doctor, the patient's self-respect, his right to decent treatment from his selected doctor and promotes thrift.

Any *ad misericordiam* appeal on the grounds of poverty is inadmissible, since doctors do not create poverty which is the result of social and industrial conditions quite outside the scope or responsibility of medical men and remediable only by industrial and social legislation. National health insurance on the lines of the English *Act* is only tinkering with the problem as compared with legislation of the sort suggested. This would provide for such illnesses as are treated in the home.

The second principle of State aid should be:

(2) That more use be made of the excellent facilities in personnel and equipment provided by public hospitals. These should be reorganized and extended on the following plan: For class (*a*) hospital treatment to remain as at present; for class (*b*) private hospital accommodation at adequate and reasonable fees. Reorganization of the service on more adequate lines is discussed later. In class (*c*) intermediate hospitals or intermediate wards in or as annexes to public hospitals.

Looking at the plan as a whole we may say as a preliminary that the best work at minimum cost is done by doctors in large central hospitals and this should be the paramount reason in favour of extension of the special type of service they give to all in the community. The excellence of hospital service in respect of medical treatment is due largely to the competitive basis of appointment. Not only is the obvious advantage of superior talent secured, but the personality also of a successful applicant for a hospital staff position is a guarantee of scientific progress. In effect, the public hospital inmate has at his disposal not only ability, but superior equipment, both for diagnosis and treatment. The high idealism of the profession so scornfully flouted by the Ministry of Health in England at the time of the initiation of the *Insurance Act*, works towards giving the best in every way.

Now this body of talent under a *per capita* scheme would refuse panel service and so would hardly benefit financially and would contribute to the general good only indirectly only when, that is, insured persons require hospital treatment.

Class (*a*) practically monopolizes this service and gets it free. Class (*b*) gets almost identical service and pays for it. Class (*c*) can get this service at a sacrifice of pride on the one hand or, on the other, by an outlay which represents a more or less serious drain on savings.

Much good would result from combining in one institution public, intermediate and private hospitals. Undoubtedly most private hospitals at present do good work and they fill a very urgent need, but it is obvious that in comparison with public hospitals their scope is limited. We must recognize also the vested interests of their present owners and staffs. In any reorganization many of these private hospitals must remain for a long

time to come, as no efficient substitute could be found for them at present, that is to say that in wealthy districts far from large centres a group hospital on a big scale would be too costly and unnecessary. But in closely settled middle-class urban and suburban areas the combined central hospital would be the institution of choice and some plan should be found for absorbing into it the staffs of private hospitals and of compensating their owners. *Pari passu* with the establishment of the new style hospital the number of licenses for private hospitals would be gradually decreased to the desired maximum.

As the system of choice we have then the centralized institution divided into three sections: (A) Free section for necessitous patients; (B) Full paying private section; (C) part paying intermediate section.

(A) The free hospital is a fine monument to medical and lay philanthropy; it is a tradition of many centuries' growth, but looked at logically it can be regarded only as a survival from times of great social, industrial and economic inequality. Concurrently with the improvement of the lot of what were really necessitous portions of the people, the stream of private beneficence is drying up. This phenomenon is especially marked in England. The only alternative solutions of the problem of upkeep are a complete control by the State and payment by patients.

Upkeep of public wards reduces itself, therefore, to three alternatives: (*a*) Voluntary private contributions with State subsidy; (*b*) complete State control and management; (*c*) payment by patients. (*a*) and (*c*) even combined are proven failures, while (b) alone or combined with (*a*) and (*c*) would not be entirely satisfactory as it would involve vexatious amateur control. The crux of the problem seems to be the curious belief of the public in a right to free treatment and nursing—a mediæval conception that with altered social conditions has lost most of its force.

The medical profession do not desire to go beyond their present attitude of voluntary free service just now, though a change is possible in the future. So that all that need be considered in respect of section (A) of institutional treatment is the minimum cost per head for all charges on the hospital purse and how the money is to be secured. We must face the necessity of balancing the ledger instead of as in the past ending each year with a large deficit. The only ways in which the money can be got, are either a universal hospital tax which would hardly be equitable if those were compelled to contribute who are also prepared to pay the whole or part of the cost of their own treatment or State-aided insurance. Policies would be issued by companies or the State to cover only hospital expenses, the amount payable weekly would, of course, be made proportionate to the premium—insured persons falling into groups corresponding to the hospital section and premiums being graded to give payments fully adequate to cover hospital charges. The insured in the public ward category (section A) and to a less extent also those in section (C) would be in receipt of State aid suitably graded. The Queensland State Workers' Compensation Insurance scheme already contains the germ of the method. All we need is an extension of that.

(B) Full paying section. Here patients would pay full medical and nursing fees.

(C) Intermediate section. Here, in addition to payment of hospital expenses, patients would also pay medical fees to their own private selected doctor. It is recognized that the class of patient using this section could not unaided pay full fees. In view of the advantage of centralization and of access to facilities of consultation and research, practitioners would probably agree to a rational reduction of the usual fees, but not, of course, to a flat rate for all patients for all illnesses.

It is specially with a view to securing specialist diagnostic service for this class, that hospital accommodation for them is to be provided. That the public recognizes this need is strikingly shown by a letter which appeared in the London *Spectator* of February 16, 1924, which announced the formation of a private mutual provident society with the special object of getting the benefit of bio-chemical, pathological and radiological investigation for those unable to pay out of their own private resources. That seems the ideal method, preferable in every way to a universal State-aided scheme, being absolutely equitable which a State scheme is not.

For all sections specialist service would be available free to (A), at full fees to (B), at a reduced rate to (C).

If the State wishes to spend money it can be done to far the best advantage by improving the mental and technical equipment of the profession starting from the top. That means that say a central research council at the Ministry of Health be constituted and that the special departments (including those of medicine and surgery) of all the greatest hospitals be either by statute or regulation made branch departments of the council at the time of the passing of any act. The council would coordinate the work of all and stimulate and encourage research by subsidy, special grants and exchange of views and literature. Selected practitioners might also be enabled to take post-graduate courses in big teaching centres with compensation for time lost from practice. This is obviously a better and more economical way of spending money than that of *per capita* grants to overworked tired panel practitioners for routine treatment of so-called minor maladies. *Per capita* contract payments are simply a bread-and-butter existence, whereas national insurance payments should be a special reward for special skilled service.

If any universal insurance scheme of this nature is founded it would be desirable that, in addition to the ordinary bonuses or rebates to non-claimants over a certain period, all or part of the profits be devoted to the endowment of research, since without research all practice, curative and preventive, must remain at a stand-still. It is obvious that compulsory self-insurance should equitably produce very large profits. Such a form of insurance should exist altogether apart from the medical profession as compulsory components of the machinery with the idea of allowing the profession to do its best unhampered.

The idea of introducing that form of insurance into Australia is indeed founded on various fallacies, the chief being the assumed existence of an analogy between English and Australian conditions. This is a very common fallacy —the attempt to apply formulæ and methods applicable to one set of conditions to an entirely different set of conditions, as, for instance, an effort to introduce Russian communism here. That was a reaction from and possibly a remedy for Tzarism which never did and never could exist in Australia. Similarly the conditions which made some form of insurance not only possible but urgent in England, do not exist here. Social conditions are, as a fact, improving in England itself and not necessarily as a result of the operation of the *Act* there.

Again, insurance presupposes a certain social equality below a certain rank. This is obviously false since the grades of wealth or poverty are infinite and accordingly the ability to pay medical fees. As each person then should pay according to his means, the operation of any insurance should be quite outside the medical profession.

The great danger of an insurance act would be that contract practice would lower the intellectual standard of the profession by diminishing legitimate self-interest which is after all the incentive to good work. With the lowering of this standard would go the standard of living of doctors. This should remain very high to give leisure for reading, funds for books and an amplitude of general culture without which we cannot compete with the science of other countries. It is difficult to see very clearly the justice of specially selecting the medical profession above all others to supply cheap contract service. The medical profession is firmly and honestly convinced that it can best serve the public interest if it is allowed to continue its professional work in freedom from outside control.

NOTE.—The proposals make no specific mention of preventive medicine which it is understood is to be made an attractive feature of the campaign for insurance. The admirable report of Drs. Hone and Newland to the Federal Committee has rendered further treatment of that question unnecessary. The present memorandum should be read in conjunction with that report.

Addendum.

Note on Research.

From the nature of the questions asked by the Commission and the evidence submitted by lay persons, it seems that what the lay public and their parliamentary representatives are anxious to secure is a contract "general practitioner" service for the treatment of the common ailments and accidents of everyday life. The layman apparently wishes to be relieved of the annoyance of having to pay fully for contingencies which he knows to exist and to have existed for centuries past. This attitude is founded on complete ignorance of and lack of sympathy with the hopes and aims of the medical profession. It is a *laissez faire* attitude which, if encouraged, will cripple progress. Lay knowledge and understanding of medical problems are notoriously backward; in respect of the simplest facts of pathology and physiology, decades and sometimes centuries behind the times. People still refer, say infective conjunctivitis to a "cold in the eye" and gonorrhœa to "strain"; they still talk of "wind round the heart" and fear the risk of contracting disease from unpleasant smells, while they still permit flies to swarm in their homes. It is obviously ludicrous to base any preventive scheme on the expressed wishes of such persons who can see nothing in medicine beyond the routine patchwork of panel service. Money spent in that way at the will of people, incompetent to see all the phases and merits of the problem, would be absolutely wasted.

It should be clearly stated that insurance on English lines, unaided by disinterested research, will affect morbidity and mortality in only the very slightest degree. In spite of the millions spent we shall have epidemics, deaths and invalidity from tuberculosis, pneumonia and cancer; we do not even pretend to understand the nature of the process we call rheumatism, while Australia's own peculiar problems have hardly been touched seriously.

It is further to be noted as a startling fact that much of the State-aided routine research work in England is incomplete and so far useless. The reason for all this is two-fold. Of the many thousands of doctors practising in the British Empire the overwhelming majority are too busy to do other than routine curative work and they have constantly before them the deplorable indifference of government and public to scientific investigations. With or without private means the investigator faces neglect and poverty. The result to be expected is obvious.

All the greatest discoveries in medicine were made by private students without a penny of State aid and then the results of their work were patent even to the very ignorant, government rewards came tardily and were but small fractions of the honours and emoluments granted to successful warriors.

These historical facts make it abundantly clear what should be governmental attitude to medical progress. Discoveries to the public benefit should be immediately rewarded, but recommendation as to their merits should not be left to lay administrators who are obviously disqualified from judging, nor even to medical men of ordinary qualification. Awards should be made by those themselves practised in research who realise its difficulties, its tediousness and the long period necessary to test a hypothesis and bring theories to practical fruition.

It is realized that the Federal Government have little money to spare, but if, as seems likely, they will devote that to health improvement, it would be tragic to see it paid away to perpetrate the present outworn system tnat seems to appeal to the ignorant layman at the expense of serious research we so earnestly need. We should pay the greatest and best talent, not the junior panel practitioner who may be competent, but who in the nature of things can have no serious effect on the morbidity and death rates.

Australia has a unique opportunity of avoiding the mistakes of old, the greatest and most costly being English national insurance and of initiating for the first time in history a national research scheme of the highest competence, by either founding fellowships on the lines of Sir Alfred Yarrow's scheme and/or by large rewards to valuable completed work.

NOTICES.

THE COUNCIL OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION wishes to suggest to members of the Branch that before making application for advertised positions of all kinds it would be wise for them to communicate with the Secretary of the Branch.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

ANDREW, MARSHALL, M.B., Ch.M., 1923 (Univ. Sydney), Grosvenor Road, Wahroonga.

BLACKBURNE, ALAN JOHN, M.B., Ch.M., 1924 (Univ. Sydney), Wyalong Street, Burwood.

BRIGGS, WEBSTER, M.B., Ch.M., 1924 (Univ. Sydney), Albury District Hospital.

BULTEAU, ALFRED WILLIAM JAMES, M.B., Ch.M., 1924 (Univ. Sydney), 91, Lyons Road, Drummoyne.

CASTLEDEN, ELSIE MARION, M.B., 1924 (Univ. Sydney), 52, Perkins Street, Newcastle.

CLEMENT, EDITH, M.B., Ch.M., 1924 (Univ. Sydney), Shepardstown.

DENNEEN, MAYNARD SCOT, M.B., Ch.M., 1924 (Univ. Sydney), Fisher Avenue, Vaucluse.

DUKE, CHARLES LESLIE SWINNERTON, M.B., Ch.M., 1923 (Univ. Sydney), 426, Darling Street, Balmain.

GEARIN, JOHN JOSEPH, M.B., Ch.M., 1924 (Univ. Sydney), 42, Alison Road, Randwick.

HORN, LOUIS JULIUS, M.B., Ch.M., 1923 (Univ. Sydney), c.o. Mr. E. A. Hellyer, I.O.O.F. Temple, 140, Elizabeth Street, Sydney.

MAIN, JAMES NORMAN, M.B., Ch.M., 1924 (Univ. Sydney), Coronation Avenue, Eastwood.

MORAN, HAROLD ELDON, M.B., Ch.M., 1924 (Univ. Sydney), New Court, Merremburn Avenue, Naremburn.

PEARSON, HENRY ROY, M.B., Ch.M., 1924 (Univ. Sydney), Middleton Street, Stanmore.

RILEY, BASIL WILLIAM BIRKENHEAD, M.B., Ch.M., 1923 (Univ. Sydney), Royal North Shore Hospital of Sydney, St. Leonards.

WOODS, JACK MCKENZIE, M.B., Ch.M., 1923 (Univ. Sydney), H.M.A.S. "Adelaide," G.P.O., Sydney.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

ANDERSON, MAY, M.B., B.S., 1924 (Univ. Melbourne), Trinity College, Melbourne.

BAILHACHE, ERIC, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

BALBONI, TULLIO MARIO, M.D. *et* Ch.D., 1922 (Rome), Elsternwick.

BOOTH, ARTHUR WILLIAM HAROLD, M.B., B.S., 1924 (Univ. Melbourne), 114, Park Street, Parkville.

COATES, ALBERT EDWARD, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

DAVIES, GEOFFREY FRANCIS SEYMOUR, M.B., B.S., 1924 (Univ. Melbourne), 60, Avoca Street, South Yarra.

HOPKINS, PAUL WILLIAM, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

JONES, GEORGE ARTHUR, M.B., B.S., 1924 (Univ. Melbourne), 15, Matlock Street, East Camberwell.

MAWSON, ARTHUR DAVID, M.B., B.S., 1924 (Univ. Melbourne), 7, Kingsley Street, Camberwell.

MCINNES, ALFRED LOTHIAN, M.B., B.S., 1924 (Univ. Melbourne), 50, Ormond Street, Kensington.

PRYDE, NOEL, M.B., B.S., 1924 (Univ. Melbourne), 58, Brunel Street, East Malvern.

SEARBY, JULIAN JOHNSTONE, M.B., B.S., 1924 (Univ. 414, Kooyong Road, Caulfield.

STAFFORD, BASIL FREDERICK ROBERTS, M.B., B.S., 1924 (Univ. Melbourne), 283, Barkers Road. Kew.

THOMAS, ROBERT SAMUEL WILLIAM, M.B., B.S., 1924 (Univ. Melbourne), 8, Brook Street, Hawthorn.
WEAVER, RUPERT GORDON, M.B., B.S., 1924 (Univ. Melbourne), Camberwell.
WEIGALL, GEORGE RALEIGH, M.B., B.S., 1924 (Univ. Melbourne), 318, St. Kilda Street, Elsternwick.
WRIGHT-SMITH, REDFORD JOHN, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING OF THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA was held at the Adelaide University on April 4, 1924.

PROFESSOR HARVEY JOHNSON exhibited smears from fresh and stale fæces obtained from a male patient in the Adelaide Hospital (March, 1924), which contained abundant nematode worms, *Strongyloides stercoralis*, in different stages of the life cycle, showing males, females and strongyliform and rhabditiform larvæ. This parasite had not previously been reported from South Australia, all other Australian records being based on findings in northern and central coastal Queensland. The patient had resided in the Gulf country (Carpentaria) for some time, but had left the north eighteen years previously. The persistence of the infection was worthy of record, though the possibility of re-infection from himself as source could not be excluded.

PROFESSOR W. A. OSBORNE inquired whether the alteration of sexual and asexual generations in nematode worms was accompanied by a change of the chromosome number.

Professor Johnson replied that there was still much doubt as to that question.

DR. PULLEINE drew attention to the efficacy of oil of chenopodium in oxyuris infections. Children were given one drop for each year of age. Magnesium sulphate was administered the evening before and the oil of chenopodium dissolved in syrup or milk in the morning, followed by a second dose of magnesium sulphate.

PROFESSOR T. BRAILSFORD ROBERTSON displayed curves comparing the growth and variabilities of normal male white mice which at five weeks of age had been found to be below the average weight at that age, with the growth and variabilities of the similar animals which had been found to be above the average weight at that age. A number of similar comparisons were being carried out for batches of mice subjected to a variety of dietary treatments. But the results exhibited indicated that in this particular batch of animals the initial sub-normality of weight was never fully compensated. The sub-normality presumably originated either in hereditary inferiority of size or in pre-natal deprivations endured during the period of lactation. Deprivations even so great as total deprivation of food in later life were easily compensated or even over-compensated by accelerated growth on re-admission of the missing constituents of the diet. If then the sub-normality originated in deprivations endured *in utero* or during lactation, such deprivations were more permanently injurious than deprivations experienced at a later age. The fact that the smaller animals were in the majority of instances derived from the larger litters lends encouragement to the view that their sub-normality originated in the inability of the mother to supply sufficient nourishment for them. Or, on the other hand, if the smallness of size was inherited, then smallness of size should be correlated with inherited tendency to produce large litters of young. The data in their possession did not enable them definitely to decide between these alternatives.

The sub-normal animals were found to be consistently less variable than the super-normal animals presumably because, whilst any fortuitous degree of super-normality could be endured without ill-effects, fortuitous degrees of sub-normality in excess of a certain limit were fatal, so that the lower extremity of the frequency curve of distribution had been eliminated by the death of the animals which occupied that position. Thus the survivors remained a more compact group than the super-normal group which had not been similarly restricted by death of the most extreme varieties.

University Intelligence.

UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on May 7, 1924. The following degrees were conferred:

Bachelor of Medicine: Mabel J. Bancroft, M. S. S. Earlam, I. M. Mackerras and R. L. Stephen;

and the following *in absentia*:

Doctor of Medicine: F. E. Barclay, G. A. McLean, H. Sundstrup, D. C. C. Sword, J. G. Wagner and J. N. Woodhead.

Master of Surgery: W. F. L. Liggins.

The following appointments were made:

Senior Demonstrator in Pharmacy: T. Hannan.

Demonstrator in Pharmacy: J. Booler.

Part-time Lecturer and Demonstrator in Physics: G. H. Godfrey, M.A., B.Sc.

A letter was received from the Director of Education in reference to two post-graduate scholarships tenable for one year, offered by the Imperial College of Science and Technology, London. The scholarships are open to graduates throughout the Commonwealth. Applications of Sydney graduates must be lodged with the Registrar not later than Tuesday May 13, for transmission to the Rector of the College who will make the selection.

The following letter was received from G. H. Bosch, of Messrs. Bosch, Barthel and Co., offering the University the sum of £1,000 to be used in the Department of Anatomy for researches on the human nervous system:

Bosch, Barthel & Co.,
114 to 120, Castlereagh Street, Sydney,
May 2, 1924.

The Acting Warden,
University of Sydney.

Dear Sir: A few days ago Dr. Sinclair Gillies and myself had the pleasure of meeting Professor Hunter and Dr. Royle who were good enough to give a demonstration showing the nature of the research work that is conducted in connexion with the treatment of spastic paralysis, and I was very much impressed to learn the results that Professor Hunter has got in his special research work, so I will be very pleased if I can help this matter in regard to the financial requirements.

With this in view I wish to offer the University of Sydney the sum of £1,000 to be used in the Anatomy Department for the researches on the human nervous system which are now being carried on by Professor Hunter, and for the publication of his results; and I wish him to have full power to expend it for these purposes as he deems fit, only with the request that from time to time he should inform me of the progress he is making. And I give him authority to employ such portion of it as may be necessary in defraying expenses already incurred in his investigations. In order to encourage similar gifts I would ask that in the publications issued in connexion with these researches reference be made to the benefaction by which they have been assisted.

Yours faithfully,
GEO. H. BOSCH.

It was decided that this gift be accepted with thanks in the terms mentioned in the letter.

The following recommendations from the Faculty of Medicine were adopted:

1. That a post-graduate course in medicine be held during the early part of September of the present year and the duration of the course be ten days.

2. That Professor J. I. Hunter be admitted to the degree of doctor of medicine with first class honours and the University medal and that he be awarded the Ethel Talbot Memorial Prize.

The report of the examiners pronounced Professor Hunter's thesis on "The Forebrain of Apterya Australis" to be of high and exceptional merit and to be worthy, not only of approbation for the degree of doctor of medicine, but of being placed in the first class for that degree.

3. That the Peter Bancroft Prize be awarded for the year 1923 to Dr. N. D. Royle for his experimental work on the problem of treatment of spastic paralysis.

4. That the regulations concerning the General Medical Council's requirements recommended by the Faculty and adopted by the Senate in July, 1923, for that year, be retained for the current year.

On the recommendation of the Faculty of Veterinary Science, Mr. I. Clunies Ross was re-appointed to the Walter and Eliza Hall Veterinary Science Research Fellowship for 1924, and the following conditions were approved by the Senate for the Baker and Ridley Memorial Price which was founded in 1924 by a gift of £100 from the Veterinary Association of New South Wales:

1. That a prize of £4 shall be awarded annually. Any accumulations are to be added to the capital sum with a view to providing a scholarship in the future.

2. The prize shall be awarded to the student in the Faculty of Veterinary Science showing the greatest proficiency in animal husbandry, including breeds and breeding, stable management, horse-shoeing, hygiene and dietetics, special attention to be given to knowledge of the application of the principles of animal husbandry under Australian conditions.

3. The prize shall be awarded by the Faculty at the conclusion of the professional examination at the end of the third year on the recommendation of the lecturer and co-examiner in each of the subjects included.

4. In the event of no candidate reaching the desired standard of proficiency in any year, the prize shall not be awarded for that year.

On the recommendation of the Professorial Board the following were granted science research scholarships for one year: P. G. Carter, B.Sc. (Organic Chemistry); I. M. Mackerras, B.Sc., M.B. (Zoology and Entomology).

The names of Sir John Macpherson and Professor Charteris were added to the Committee appointed by the Senate to consider the question of the establishment of a Chair of Anthropology.

The Senate approved of the following recommendations of the Cancer Research Committee.

1. That the Cancer Research Committee and Committee of Advice be combined and known in future as the Cancer Research Committee.

2. That a deputation consisting of the Chancellor, the Vice-Chancellor, the Acting Warden, Sir William Vicars, Mr. D. Benjamin and Professor Sandes he appointed to interview the Minister for Health at a convenient date in order to lay before him the whole scheme of the Cancer Research Campaign.

Obituary.

MELVILLE BIRKS.

DR. MELVILLE BIRKS, whose death was recorded in our issue of May 17, 1924, after a long illness, was widely known as superintendent of the Broken Hill Hospital. In this capacity he created a reputation in Broken Hill that will not readily be effaced.

Melville Birks was born at Norwood, South Australia, on January 30, 1876. He received his primary education at various State schools and then proceeded for a short time to Prince Alfred College. He was always found of natural history and as his health in adolescence caused anxiety, it was decided that he should take up some out-door occupation. He was accordingly sent to Roseworthy Agricultural College, where he spent three years, gaining his diploma and being silver medalist of his year.

When the opportunity shortly afterwards arose of gratifying his old desire to take up medicine, he was compelled to start his preliminary scientific studies all over again. For this purpose he went to Way College for three years, whence he matriculated and proceeded to the Adelaide University, graduating as bachelor of medicine and bachelor of surgery in 1903. He was resident house surgeon at the Adelaide Hospital in the following year and then proceeded to England where he did post-graduate study in London and elsewhere. He was admitted to the fellowship of the Royal College of Surgeons of England in 1907. During these years he had a wide and varied medical experience, ranging from the London Hospital to *locum tenens* work in a shilling east-end London practice. Subsequently he took a short trip to Vienna and other continental cities for further experience and for a few months had the opportunity of gaining first-hand knowledge of medical practice in Cairo.

Returning to South Australia in 1908, he practised for five years in Peterborough. Soon after his return he married Miss MacIntyre, a daughter of Mr. P. B. MacIntyre, of Findon, Rosshire, of Crofters' Commission fame.

He quickly became noted for the carefulness and skill of his professional work as well as for his interest in the public life of the town. When he left Peterborough he was mayor of the town, chief of the local Caledonian society and a leader in the work of his church.

Thoroughness was his motto throughout his professional work and he always felt that lodge practice interfered with his doing his best work; consequently when in 1913 a new position was created at the Broken Hill Hospital of a resident surgeon who should be directly responsible for all surgical work at the hospital, he eagerly grasped the opportunity of gratifying at the same time his desire for active surgery and for thorough work.

For six months he worked there with Dr. Seabrook still occupying the position of medical superintendent. When the latter resigned his position Melville Birks succeeded him as medical superintendent and during the next nine years gained for himself a unique position in the esteem of the residents of Broken Hill. His chief interest was still in surgery. As an operator he was sound and conservative in his methods. His chief achievement probably was the development of the aseptic technique of the hospital to a pitch hitherto unknown in Australia. This sounds an extreme statement, but is justified by the opinions of his colleagues. With a shortage of medical officers caused by the war, Melville Birks had organized a system by which senior medical students at the Adelaide Hospital occupied junior positions on the staff of the Broken Hill Hospital during their short and long vacations. There are no keener critics than medical students, but each individual student who took one of these positions, returned to Adelaide with quite a new conception of the meaning of asepsis.

During the war Melville Birks came to Adelaide three times to volunteer for active service abroad, but owing to the urgency of his work at the hospital he was not accepted, and consequently he threw himself more wholeheartedly into developing the efficiency of the Broken Hill Hospital. He re-organized the whole system of administration and so impressed the community with the claims of the hospital that during his nine years' occupancy of the medical superintendentship the accommodation in the hospital grew from seventy to one hundred and sixty beds. A new nursing home, a new laboratory, a new X-ray room, an isolation block and a children's ward were added and the staff was increased by the addition of a senior and two junior house surgeons. The fact that these extensions were made during and just after the war period shows the confidence he had inspired and the cooperation he secured from both mine officials and the various miners' organizations and reveals also his wide range of thought

and vision, even though surgery always occupied first place in his interest.

His concentration on his hospital duties compelled him to forego participation in many public interests, but he frequently lectured before the members of the Broken Hill Branch of the Workmen's Educational Association, on technical and health matters and was an active member of the committee of Boys' Brigade.

From his position of medical referee at Broken Hill under the *Workmen's Compensation Act* he naturally became deeply interested in the relation between mining occupations and the diseases seen at Broken Hill. He was always sympathetic to the individual handicapped by illness, and so great was the confidence reposed in his judgement by the miners that his decision that a miner's invalidity was not due to his occupation, was never questioned by them. His place in their affections is shown by the fact that during his long illness subscription lists were quietly opened up at Broken Hill and after his death two representatives waited on his widow with a gift of £500.

His health gave way during 1916 and he took a three months' trip to Java and the East. Six months after the close of the war he was granted a year's leave by the Hospital Board and went with his wife and family to Great Britain and America. During this trip he visited most of the important industrial hospitals in England and Scotland and attended the Medical Congress at Brussels where he submitted a paper on occupational diseases. He returned to Australia by way of America and Canada where he made further investigations into these matters.

Returning to Broken Hill in 1920, he continued his work until the middle of 1922, when an obscure illness, characterized chiefly by recurring attacks of pyrexia developed. Removal to Victoria effected no improvement and for eleven months he was in a private hospital and then in the Melbourne General Hospital for three months. In December he was sufficiently recovered to be brought home to Adelaide, but the improvement turned out to be only temporary and the symptoms recurred, causing gradual failure of strength until he succumbed. His long weary illness was borne with exemplary fortitude, a fitting close to a life devoted to the service of others.

His loss will be deeply felt throughout the profession and especially in Broken Hill, as he united a fine professional skill with a profound sense of responsibility and a very deep and sincere humanitarianism.

He was too straightforward to fail in arousing opposition at times when such grave issues were at stake as those which came to light with the long industrial conflict at Broken Hill, but while both sides occasionally found themselves in opposition to him, whether they agreed with him or differed from him, there was no diminution in the respect and affection in which he was held.

His widow and a family of one daughter and two sons survive him and to them much heartfelt sympathy will be extended.

EDWARD HENRY EMBLEY.

IT is with regret that we have to announce the death of Dr. Edward Henry Embley which occurred at Camberwell, Victoria, on May 9, 1924.

Proceedings of the Australian Medical Boards.

VICTORIA.

THE following have been registered, under the provisions of the *Medical Act, 1915*, as duly qualified medical practitioners:

AHERN, ALBERT JOHN WILLIAM, M.B., B.S., 1924 (Univ. Melbourne), 21, Herbert Street, St. Kilda.

ANDERSON, MAY, M.B., B.S., 1924 (Univ. Melbourne), Bryngola, Digby.

BAILHACHE, ERIC, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

BLANCHE, MONA MARGARET, M.B., B.S., 1924 (Univ. Melbourne), 17, Tintern Avenue, Toorak.

BOOTH, ARTHUR WILLIAM HAROLD, M.B., B.S., 1924 (Univ. Melbourne), 114, Park Street, Parkville.

BOWMAN, BERYL ŒNONE, M.B., B.S., 1924 (Univ. Melbourne), Rostrevor Parade, Mont Albert.

BROWN, DONALD MONTAGUE, M.B., B.S., 1924 (Univ. Melbourne), Alfred Hospital, Prahran.

BROWNE, FRANCIS ESMOND, M.B., B.S., 1924 (Univ. Melbourne), 90, Westgarth Street, Northcote.

BURTON, ERNEST JOSEPH, M.B., B.S., 1924 (Univ. Melbourne), St. Vincent's Hospital, Fitzroy.

COATES, ALBERT ERNEST, M.B., B.S., 1924 (Univ. Melbourne), 12, Denmark Hill Road, Upper Hawthorn.

COCKERILL, JOHN EDWARD, M.B., B.S., 1924 (Univ. Melbourne), 54, Studley Park Road, Kew.

COOMBS, FRANCIS SYNDAL, M.B., B.S., 1924 (Univ. Melbourne), Alfred Hospital, Prahran.

COTTER, TIMOTHY JOHN, M.B., B.S., 1924 (Univ. Melbourne), St. Vincent's Hospital, Fitzroy.

CRAIG, CLIFFORD, M.B., B.S., 1924 (Univ. Melbourne), 56, Main Street, Box Hill.

DAVIES, GEOFFREY FRANCIS SEYMOUR, M.B., B.S., 1924 (Univ. Melbourne), 60, Avoca Street, South Yarra.

DELANY, VICTOR RUPERT, M.B., B.S., 1924 (Univ. Melbourne), "The Astor," St. Kilda Road, South Melbourne.

DICKMANN, ARTHUR EWINS, M.B., B.S., 1924 (Univ. Melbourne), 434, Swan Street, Burnley.

FONE, JACK MCFARLANE, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

GARRETT, BERNARD BALFOUR, M.B., B.S., 1924 (Univ. Melbourne), 13, High Street, Coburg.

GILLIES, CLYDE DOUGLAS, M.B., B.S., 1924 (Univ. Melbourne), Gray Road, Hill End, South Brisbane.

GREEN, ARTHUR HAMILL, M.B., B.S., 1924 (Univ. Melbourne), 11, Park Street East, Brunswick.

HADLEY, KENNETH HOWARD, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

HEALE, TOM ALLISTAIR FALCONER, M.B., B.S., 1924 (Univ. Melbourne), 31, Albany Crescent, Surrey Hills.

HEWITT, ALAN BOSWELL, M.B., B.S., 1924 (Univ. Melbourne), "The Manse," Wycheproof.

HILLER, BERTHOLD, M.B., B.S., 1924 (Univ. Melbourne), Murto.

HOPKINS, PAUL WILLIAM, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

JOHNSON, RICHARD WILLIAM, M.B., B.S., 1924 (Univ. Melbourne), Melbourne Hospital.

JONES, GEORGE ARTHUR, M.B., B.S., 1924 (Univ. Melbourne), 15, Matlock Street, East Camberwell.

LIEBERT, AMANDA ANNIE GERTRUDE, M.B., B.S., 1924 (Univ. Melbourne), 20, Berkeley Street, Glenferrie.

MACLEOD, KENNETH JOHN, M.B., B.S., 1924 (Univ. Melbourne), "Glendale," Coleridge Street, Kew.

MATTHEWS, FRANCIS JOSEPH, M.B., B.S., 1924 (Univ. Melbourne), 24, Woolton Avenue, Northcote.

MAWSON, ARTHUR DAVID, M.B., B.S., 1924 (Univ. Melbourne), 7, Kingsley Street, Camberwell.

MCINNES, ALFRED LOTHIAN, M.B., B.S., 1924 (Univ. Melbourne), 50, Ormond Street, Kensington.

MCKENNA, NOEL VERNON, M.B., B.S., 1924 (Univ. Melbourne), Glencara Park, Maribyrnong.

O'DONNELL, KENNETH FRANCIS, M.B., B.S., 1924 (Univ. Melbourne), Myrtleford.

O'DONNELL, MICHAEL FRANCIS, M.B., B.S., 1924 (Univ. Melbourne), 11, Hilda Crescent, Hawthorn.

O'LOUGHLIN, WILLIAM JAMES, M.B., B.S., 1924 (Univ. Melbourne), St. Vincent's Hospital, Fitzroy.

PRYDE, NOEL, M.B., B.S., 1924 (Univ. Melbourne), 58, Brunel Street, East Malvern.

ROSS, FRANK COWARD HOPE, M.B., B.S., 1924 (Univ. Melbourne), 9, Black Street, Middle Brighton.

RUSH, KEVIN PATRICK, M.B., B.S., 1924 (Univ. Melbourne), 21, Docker Street, Richmond.

SAXTON, WILLIAM JOHN, M.B., B.S., 1924 (Univ. Melbourne), Alfred Hospital, Prahran.

SCANLON, ERNEST FRANCIS STANLEY, M.B., B.S., 1924 (Univ. Melbourne), 777, Rathdown Street, North Carlton.

SEARBY, JULIAN JOHNSTONE, M.B., B.S., 1924 (Univ. Melbourne), 414, Kooyong Road, Caulfield.
SEELEY, DUDLEY MUNSTER, M.B., B.S., 1924 (Univ. Melbourne), 54, Finch Street, East Malvern.
STAFFORD, BASIL FREDERICK ROBERTS, M.B., B.S., 1924 (Univ. Melbourne), 283, Barkers Road, Kew.
STONE, VICTOR SOLOMON, M.B., B.S., 1924 (Univ. Melbourne), 72, Victoria Street, Ballarat East.
THOMAS, HORACE STUART, M.B., B.S., 1924 (Univ. Melbourne), 35, Balwyn Road, Canterbury.
THOMAS, ROBERT SAMUEL WILLIAM, M.B., B.S., 1924 (Univ. Melbourne), c.o. Mrs. Harrison, 8, Brook Street, Hawthorn.
WEAVER, RUPERT GORDON, M.B., B.S., 1924 (Univ. Melbourne), "Southerton Vale," Boort.
WEBB, ARTHUR LIONEL BRIDGES, M.B., B.S., 1924 (Univ. Melbourne), High Street, Broadford.
WEIGALL, GERALD RALEIGH, M.B., B.S., 1924 (Univ. Melbourne), 318, St. Kilda Street, Elsternwick.
WHITWORTH, JAMES LISTER, M.B., B.S., 1924 (Univ. Melbourne), "Harlistan," Korumburra.
WILLIAMS, JOHN FRANCIS, M.B., B.S., 1924 (Univ. Melbourne), "Muralla," Clendon Road, Toorak.
WRIGHT-SMITH, BEDFORD JOHN, M.B., B.S., 1924, (Univ. Melbourne), 29, Hopetoun Street, Elsternwick.

Medical Prizes.

THE PETER BANCROFT PRIZE.

THE announcement is made elsewhere in this issue that the Peter Bancroft Prize for 1923 has been awarded to Dr. N. D. Royle for his experimental work on the treatment of spastic paralysis.

The Peter Bancroft Prize is of recent creation and is awarded annually for original work in medicine or surgery. An account of Dr. Royle's experiemental investigations was given in our issue of January 26, 1924. Medical practitioners will be gratified to know that the original work of this investigation has been recognized by his *alma mater*.

Books Received.

SELECTIONS FROM THE WORK OF AMBROISE PARÉ, with Short Biography and Explanatory and Bibliographical Notes by Dorothea Waley Singer; 1924. London: John Bale, Sons and Danielsson, Limited; Crown 8vo., pp. 246, illustrated. Price: 12s. 6d. net.

Medical Appointments.

PURSUANT to the provisions of Section 7 of the *Midwives Act, 1915* (*No. 2773*) of Victoria, the undermentioned have been appointed officers for the purposes of the Midwives Board: DR. G. E. COLE (B.M.A.), DR. H. N. FEATONBY (B.M.A.), DR. J. J. HARRIS (B.M.A.), DR. C. R. MERRILEES (B.M.A.), DR. C. P. ROWAN (B.M.A.) and DR. R. W. TELFORD (B.M.A.).

* * * *

DR. H. P. ELLIOTT (B.M.A.) has been appointed Government Medical Officer at Binalong, New South Wales.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi..

ROYAL NORTH SHORE HOSPITAL OF SYDNEY: (*a*) Honorary Medical Officer, Anti-Tuberculosis Dispensary; (*b*) Honorary Assistant Surgeon for Diseases of the Ear, Nose and Throat; (*c*) Two Clinical Assistants (Non-Resident).

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Society's Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, Saint George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

JUNE 4.—Victorian Branch, B.M.A.: Branch.
JUNE 6.—Queensland Branch, B.M.A.: Branch.
JUNE 10.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 11.—Melbourne Pædiatric Society.
JUNE 11.—Tasmanian Branch, B.M.A.: Branch.
JUNE 11.—Central Northern Medical Association, New South Wales.
JUNE 12.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 12.—Brisbane Hospital for Sick Children: Clinical Meeting.
JUNE 13.—Queensland Branch, B.M.A.: Council.
JUNE 13.—South Australian Branch, B.M.A.: Council.
JUNE 17.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 18.—Victorian Branch, B.M.A.: Council.
JUNE 18.—Western Australian Branch, B.M.A.: Branch.
JUNE 18.—South Sydney Medical Association, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)

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